

Spot-characters

An aid for identification of families and genera

M. M. J. van Balgooy

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PREFACE

The Malesian region, which includes the nation states of Brunei Darussalam, Indonesia, Malaysia, Papua New Guinea, the Philippines, and Singapore, harbours one of the richest and most diverse tropical floras of the world. Currently the flowering plants are estimated to include about 36,000 species, of which only 15% have been recently revised and treated in *Flora Malesiana*. Of the other 85% information is scattered in specialized literature or completely wanting. Meanwhile there is an increasingly urgent need for biodiversity expertise that will enable identification of the remaining botanical resources of Malesia, both the endangered primary vegetations as well as the rapidly expanding, yet disturbed, species-rich secondary ecosystems.

The recognition to which family a plant belongs, is the first, and often most important step to species identification, and consequently to all scientific and practical information on an unknown plant. Identification keys to the whole Malesian flora are not available. Regional works like the *Tree Flora of Malaya* and the *Flora of Java* fill important gaps in this respect, but there is a widely felt need for user-friendly identification means for the whole of Malesia.

The series '*Malesian Seed Plants*' by Dr. M. M. J. van Balgooy for the first time offers such a tool. Having spent his youth among the plants of Java, Dr. van Balgooy developed his unique botanical knowledge under the guidance of Prof. Dr. C. G. G. J. van Steenis, the founder of the *Flora Malesiana* project. In this series the author shares part of that knowledge in original accounts of all Malesian plant families, and in lists of spot-characters that easily lead to family or genus recognition. The descriptions are designed as portraits, highlighting the occurrence of these spot-characters: they are not intended as comprehensive and comparable descriptions in the classical sense. That remains the realm of *Flora Malesiana* and other floras. Numerous illustrations are included to facilitate the use of the 'spot-characters' and 'portraits', and technical terms have been avoided where possible, or are clearly explained.

On behalf of the Foundation *Flora Malesiana* I express the hope that many professionals and amateur botanists will use these books to familiarize themselves with the rich Malesian flora. Ultimately, it is hoped that this book will contribute to the protection and rational utilization of the botanical resources of the biodiversity megacentre of the Malesian region.

Bogor, January 1997

Prof. Dr. Mien A. Rifai

Chairman of the Board of the Foundation *Flora Malesiana*

Assistant Minister of State for Research and Technology

Republic of Indonesia

INTRODUCTION

Historical background

The concept of this book has taken some decades to acquire a definite shape. About thirty years ago I started attending the so-called pre-identification sessions of the then director of the Rijksherbarium, Prof. C.G.G.J. van Steenis († 14 May 1986) and Dr. R.C. Bakhuizen van den Brink Jr. († 1 May 1987), the co-author of the 'Flora of Java' (Backer & Bakhuizen van den Brink, 1963–1968). They spent one day a week going through all incoming material, checking the identifications on the labels and identifying unnamed specimens. The plants not recognized at first sight were put aside for further scrutiny. It was usually Rein Bakhuizen who enjoyed cracking the hard nuts. In the case of identifying trees Van Steenis and Bakhuizen very often relied on Mr. F.H. Hildebrand († 7 July 1975), who, as a former forester of the Forest Research Institute in Bogor, had a vast knowledge of Malesian tree species.

These sessions were quite unforgettable, although I must admit that the first few years were pretty rough. The two went through the piles of material like a whirlwind, each trying to beat the other in naming the plants. The only break I had was when they had an argument, or when I put in a silly question, such as: "How do you know?"

In the beginning I was quite overawed by the seemingly unlimited knowledge of the three gentlemen and I was absolutely convinced that it was impossible for me to store away so many plant names and characters into my memory. Each of the three had his own method of memorizing plants. Van Steenis was in the habit of jotting down on small scraps of paper all striking characters he came across, to enter them later in a kind of record book. Hildebrand used to prepare sketches of all plants he identified. These pencil drawings have been assembled in nineteen volumes which are kept in the library of the Rijksherbarium, where I still consult them regularly. Bakhuizen used to go through lists of genera of the various families. Whenever he encountered a name which he could not associate with a clear mental picture of the plant he went to the collection to see what it looked like. I myself used to write down everything I heard during conversations with all three seniors.

Several of my young colleagues who regularly attended the pre-identification sessions also complained that it was very difficult to remember the numerous family and genus characters. To aid our memory Van Steenis and Bakhuizen compiled the constant characters of some 100 Malesian flowering plant families (in Dutch). Some twenty years ago Van Steenis entrusted me with his record book of spot-characters. Since then I have finished family characterizations for all but a few herbaceous families and have more than doubled the number of spot-characters. A booklet by Dr. P.J.M. Maas, "Neotropische flora van A tot Z", describing all Neotropical families, has further helped to give the present effort its definite shape. This work has also appeared in an English translation (Maas & Westra, 1993).

Until today I am still adding to the lists of spot-characters and one might wonder if the present publication is not premature. However, several colleagues have pleaded with me to make available the knowledge built up over many years, so that it can serve as a tool in plant naming at the various institutes in the area. The data may eventually also be used to generate a computer key.

After consultation with various colleagues it was decided to bring all this information together under the general title 'Malesian Seed Plants' in three books: Volume 1 'Spot-characters', Volume 2 'Portraits of tree families', and Volume 3 'Portraits of non-tree families'. Volumes 2 and 3 will contain brief characterizations of the various seed plant families, 'portraits'. Each volume will be published separately.

About this book

Volume 1 of the series 'Malesian Seed Plants' contains lists of spot-characters most of which, with some training, can be easily observed in herbarium material. These characters have been arranged in a more or less logical way, e. g., characters of the stem, the leaves, the flowers, the fruits, etc. Each spot-character is explained and, where appropriate or possible, illustrated. As stated above, the lists are updated until the last moment before publication, but some are still desperately incomplete. Moreover, many spot-characters I use when identifying plants are difficult to put in words and have not been listed. These include shades, colour and texture of dried material, 'feel' and smell. Also not listed are many field characters such as those of slash and bark, crown-shape and architecture, because they are of little use to identify herbarium material.

The lists of spot-characters also contain a few non-Malesian taxa which I happened to have come across, but no attempt has been made at completeness for these extra-Malesian taxa. They are not mentioned under the heading 'spot-characters' in the family portraits of Volumes 2 and 3. Every entry has been checked in the herbarium and I have not relied on data from literature.

Although the text of this volume was finished in 1994 (and updated until end 1996), publication has unfortunately been long delayed due to problems with my health. In the meantime an interesting identification manual has been published (Keller, 1996), but I have not been able to test it, neither to incorporate data from this book into mine.

By publishing this book for the benefit of the botanical community the deficiencies can be revealed and hopefully corrected in a future revised edition. Users of this volume are kindly invited to send corrections and additions to the Rijksherbarium / Hortus Botanicus, P.O. Box 9514, 2300 RA Leiden, The Netherlands.

Literature

- Keller, R. 1996. Identification of tropical woody plants in the absence of flowers and fruits. A field guide. Basel, etc.
- Maas, P.J.M. & L.Y.Th. Westra. 1993. Neotropical plant families. A concise guide to families of vascular plants in the neotropics. Koenigstein / Champaign.

Abbreviations and signs

- (AS) behind a name indicates that the taxon is only known from Asia
- (Au) taxon only known from Australia
- (P) taxon only known from the Pacific
- p.p. the spot-character is not always visible or is found only in part of the taxon
- * the taxon is represented in Malesia by introduced species only

ACKNOWLEDGEMENTS AND DEDICATION

Several people have contributed to the completion of this book. Attempting to name them all holds the risk of forgetting some. Therefore, let it suffice to mention by name just a few who have substantially helped to improve the text. Mr. K.M. Kochummen has supplied me with additional spot-characters. Dr. P.F. Stevens and Mr. M.J.E. Coode critically read the text and suggested many corrections. A great many colleagues both from abroad and from the Rijksherbarium have given advice, information and encouragement. Prof. C. Kalkman critically read the final version of the manuscript. I am grateful to Prof. P. Baas who convinced me to overcome reluctance against publishing this work.

My assistant, Mr. L.B.T. Kostermans, has helped to type and retype the various versions of this book and Ms. E.E. van Nieuwkoop gave the finishing touches in the lay-out with all the skills we have come to expect from her. Ms. J.R. Kruijer helped to select the illustrations and Mr. J.H. van Os prepared many of them for publication. I am indebted to various persons and institutions for the permission to reproduce drawings; their collaboration is acknowledged with the illustrations.

I am particularly obliged to my former teachers in the art of identification, Prof. Van Steenis and Dr. Bakhuizen van den Brink, who have taught me almost all they knew about Malesian plant taxonomy. It is therefore to their memory that I dedicate this book in gratitude.

Leiden, 1997

M.M.J. van Balgooy

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HABIT (characters 1–13)

1. Cushion plants — Fig. 1

These are plants that form compact masses, often in the form of a cushion. This habit is very common in the South American Andes and in New Zealand; in Malesia this habit is almost confined to alpine vegetation on the highest mountains, especially in New Guinea; examples *Centrolepis* and *Rhododendron saxifragoides*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Astelia</i> p.p.	Liliac.	<i>Oreobolus</i>	Cyp.
<i>Centrolepis</i>	Centr.	<i>Oreomyrrhis</i> p.p.	Umb.
<i>Cerastium</i> p.p.	Caryoph.	<i>Plantago</i> p.p.	Plant.
<i>Coprosma archboldiana</i>	Rub.	<i>Pleiocraterium gentianifolia</i>	Rub.
<i>Danthonia</i> p.p. (<i>Monostachya</i>)	Gram.	<i>Potentilla</i> p.p.	Rosac.
<i>Drosera</i> p.p.	Dros.	<i>Rhaphogyne</i>	Comp.
<i>Eriocaulon</i> p.p.	Erioc.	<i>Rhododendron caespitosum</i>	Eric.
<i>Gaimardia</i>	Centr.	<i>Rhododendron saxifragoides</i>	Eric.
<i>Gentiana</i> p.p.	Gent.	<i>Sagina</i> p.p.	Caryoph.
<i>Geranium</i> p.p.	Geran.	<i>Trachymene</i> p.p.	Umb.
<i>Isachne</i> p.p.	Gram.	<i>Trigonotis</i> p.p.	Borag.
<i>Lactuca</i> p.p.	Comp.	<i>Xyris</i> p.p.	Xyr.
<i>Lepidium</i> p.p. (<i>Papuzilla</i>)	Cruc.		

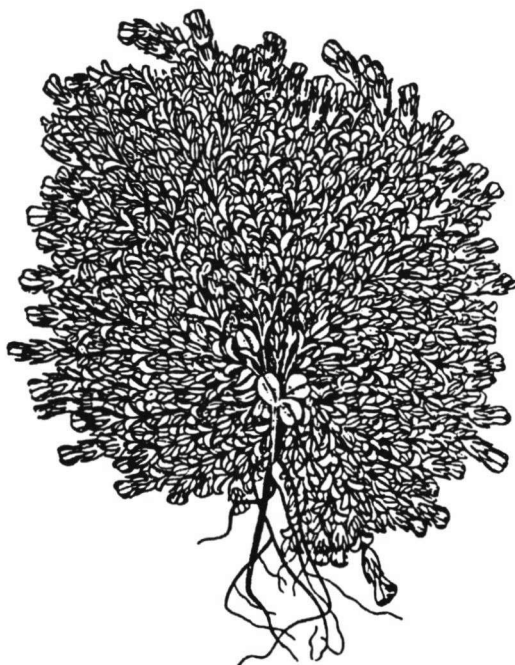


Figure 1. Cushion plants – *Gentiana quadrifaria*.

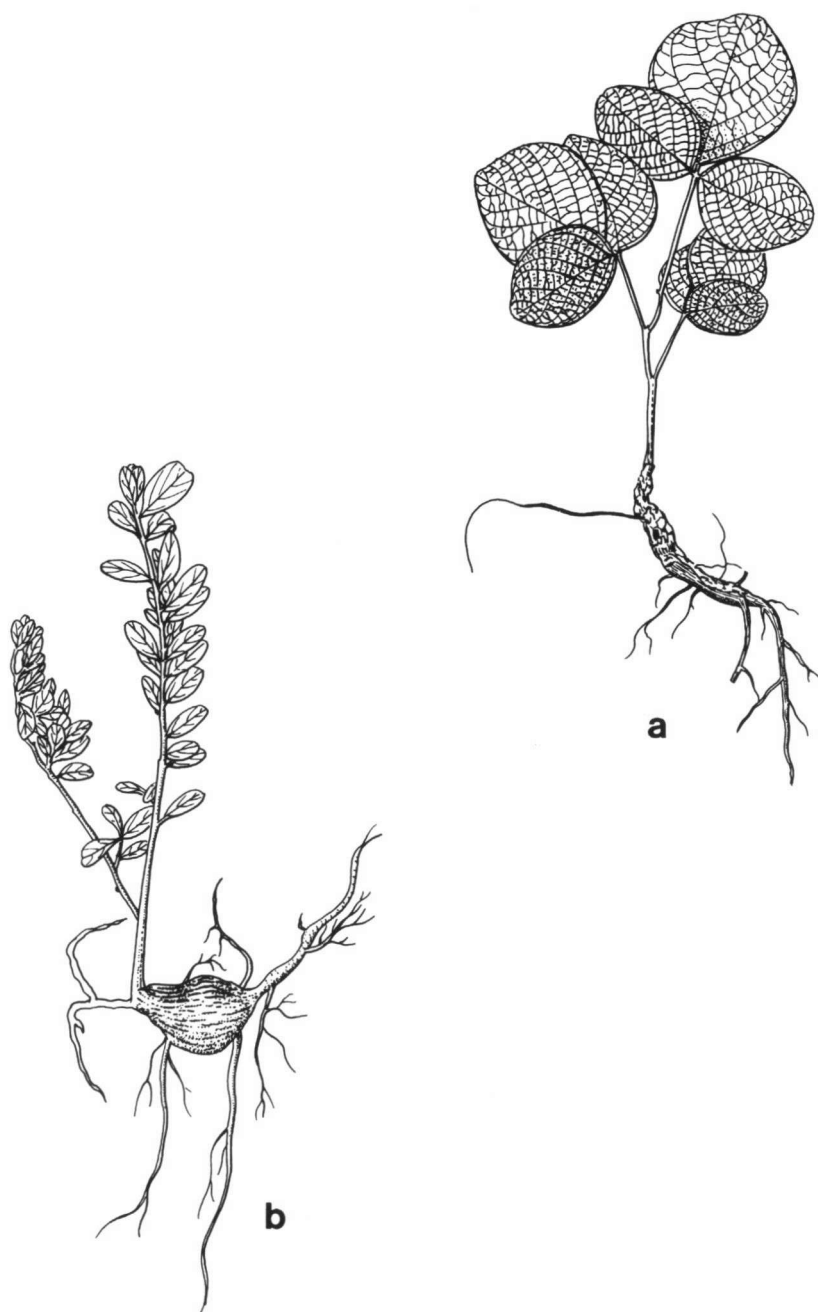
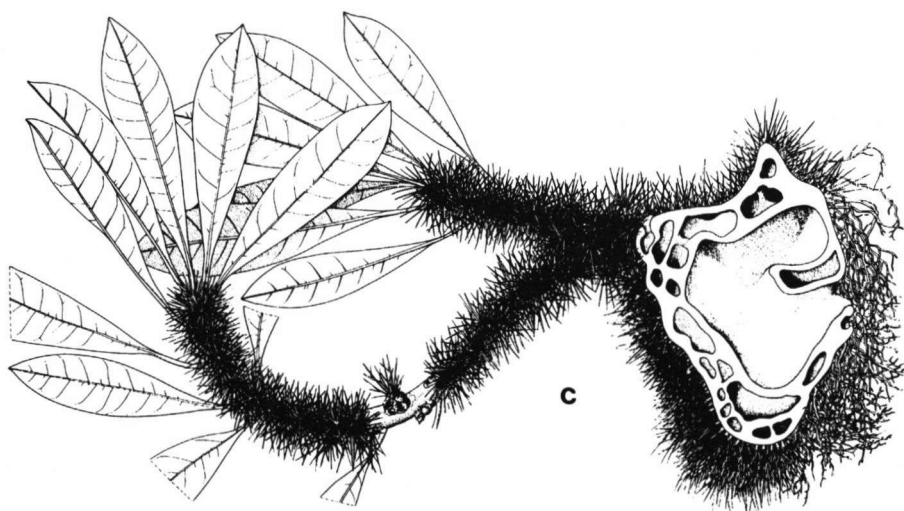


Figure 2. Swollen stems – a. *Butea monosperma*; b. *Vaccinium lucidum*; c. *Anthorrhiza chrysacantha* (see next page).

2. Swollen stems — Fig. 2

Plants with gouty or swollen stems; in some species, such as the *Hydnophytinae*, they are hollow and inhabited by ants, in others they store water, as in some *Impatiens*. In other taxa they consist of underground parts (lignotubers) by which the plant survives fires or severe droughts, a rare phenomenon in Malesia but common in Australia.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Agapetes</i> p.p.	Eric.	<i>Myrmecodia</i>	Rub.
<i>Anthorrhiza</i>	Rub.	<i>Myrmephytum</i>	Rub.
<i>Brachychiton</i> p.p. (Au)	Sterc.	<i>Neoalsomitra</i> p.p.	Cuc.
<i>Butea monosperma</i> p.p.	Leg.	<i>Neptunia oleracea</i>	Leg.
<i>Cissus</i> p.p.	Vit.	<i>Pachycentria</i>	Melast.
<i>Hydnophytum</i>	Rub.	<i>Pachynema</i> (Au)	Dill.
<i>Impatiens</i> p.p.	Bals.	<i>Planchonia</i> p.p. (Au)	Lecyth.
<i>Jatropha</i> *	Euph.	<i>Pogonanthera</i>	Melast.
<i>Leguminosae</i> p.p.	Leg.	<i>Premna</i> p.p. (<i>Pygmaeopremna</i>)	Verb.
<i>Leucas</i> p.p.	Lab.	<i>Vaccinium</i> p.p.	Eric.
<i>Medinilla</i> p.p.	Melast.	<i>Vitex</i> p.p.	Verb.



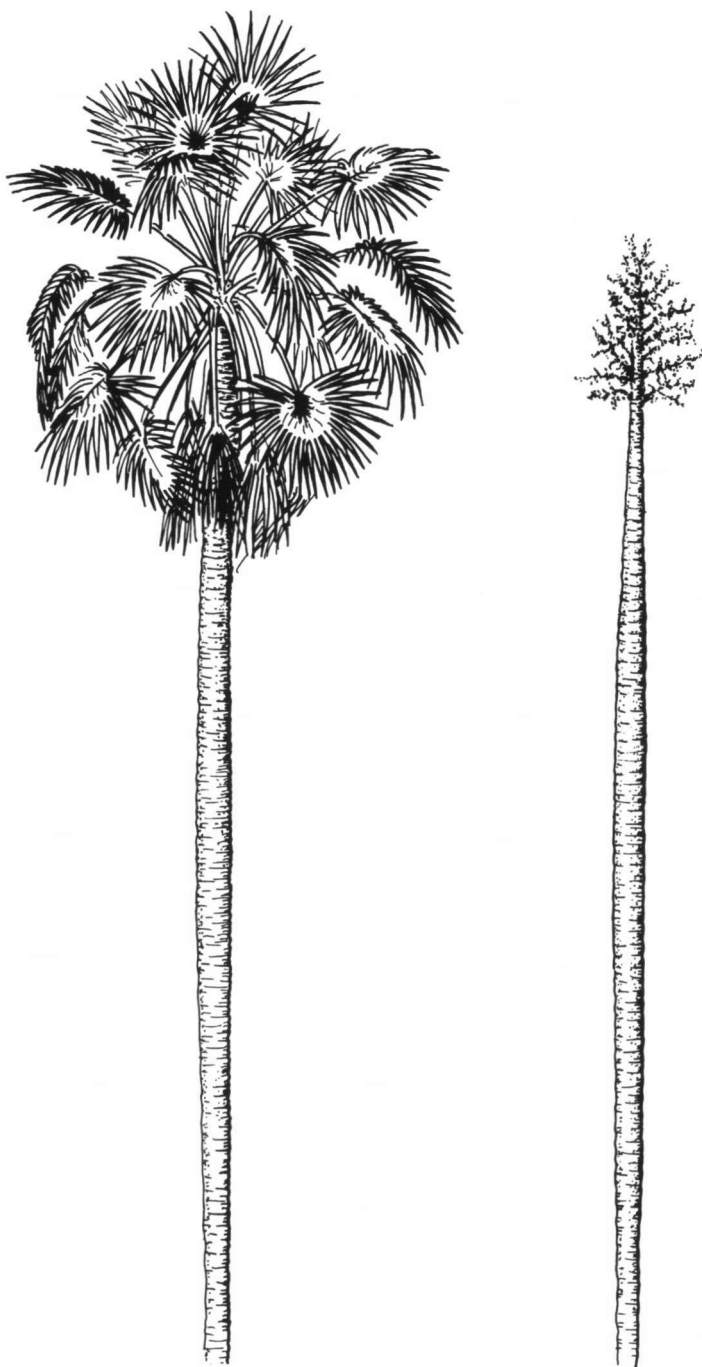


Figure 3. Monocarpic plants – *Corypha elata*.

3. Monocarpic plants — Fig. 3

These are perennial plants that produce one inflorescence after which they die, as for instance in *Metroxylon*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Agave</i> *	Liliac.	<i>Harmsiopanax</i>	Aral.
<i>Bambusoideae</i> p.p.	Gram.	<i>Metroxylon</i>	Palm.
<i>Corypha</i>	Palm.	<i>Strobilanthes</i> p.p.	Acanth.

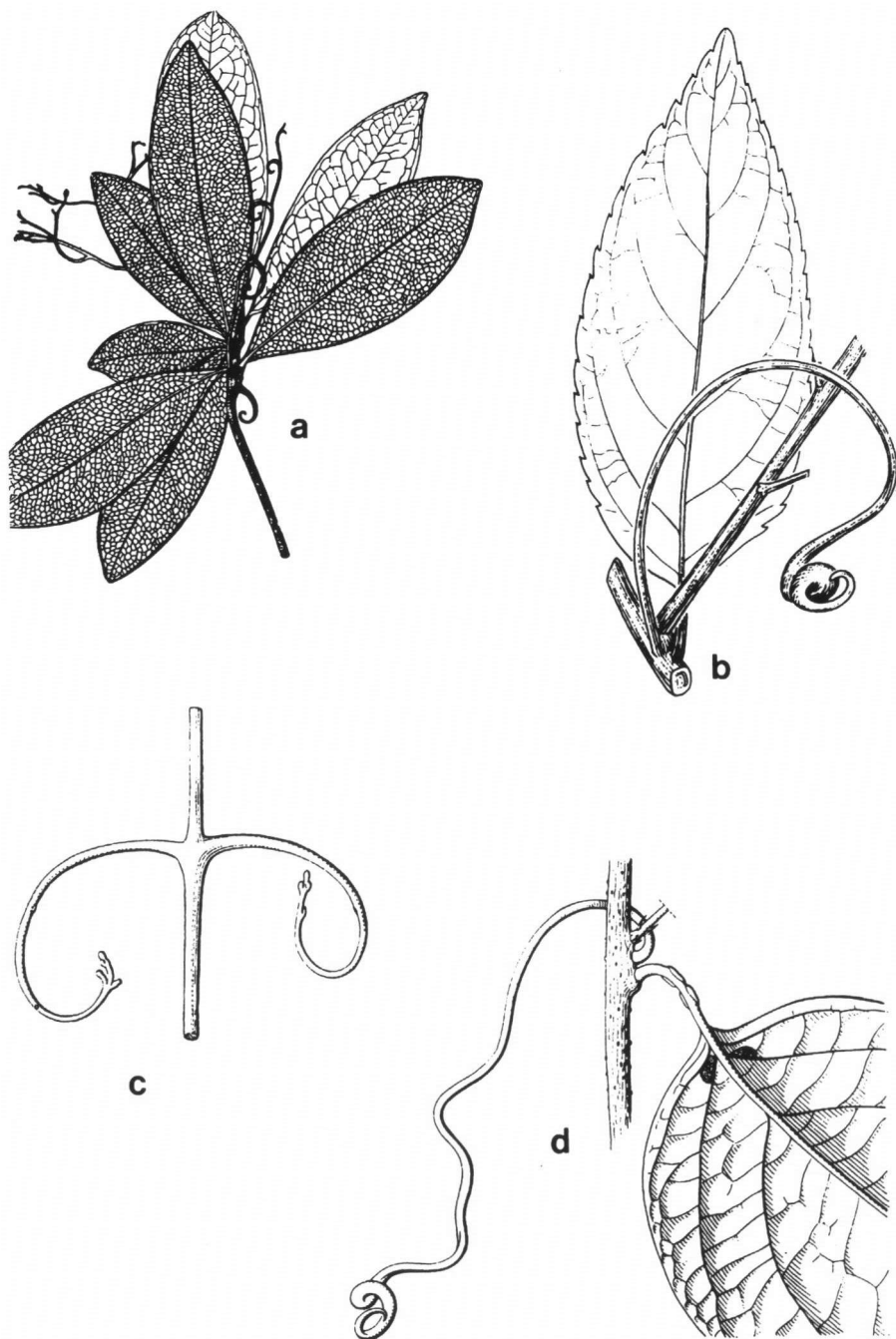


Figure 4. Climbers with hooks / tendrils – a. *Ancistrocladus tectorius*; b. *Lophopyxis maingayi*; c. *Enkleia malaccensis*; d. *Hollrungia aurantioides*.

4. Climbers with hooks/tendrils — Fig. 4, 6b

Plants that climb by means of some special aid. This can be in the form of prehensile tendrils, such as in *Cucurbitaceae* or *Vitaceae*; special branches that grow around foot-holds, such as seen in many climbing *Annonaceae*; yet others have curved woody hooks such as found in *Uncaria* and many rattans.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acacia</i> p.p.	Leg.	<i>Lathyrus</i> *	Leg.
<i>Adenia</i>	Passifl.	<i>Lophopyxis</i>	Loph.
<i>Ampelocissus</i>	Vit.	<i>Luvunga</i>	Rut.
<i>Ampelopsis</i>	Vit.	<i>Lysiphylum</i>	Leg.
<i>Ancistrocladus</i>	Ancistr.	<i>Maclura</i>	Morac.
<i>Antigonon</i> *	Polygon.	<i>Melodorum</i>	Annon.
<i>Artabotrys</i>	Annon.	<i>Mimosa</i> *	Leg.
<i>Bauhinia</i> p.p.	Leg.	<i>Myrialepis</i>	Palm.
<i>Bignoniaceae</i> p.p.*	Bign.	<i>Naravelia</i>	Ranunc.
<i>Bougainvillea</i> *	Nyctag.	<i>Nepenthes</i>	Nepenth.
<i>Bracteolanthus</i>	Leg.	<i>Nothocissus</i>	Vit.
<i>Caesalpinia</i> p.p.	Leg.	<i>Olaux</i>	Olacac.
<i>Calamus</i>	Palm.	<i>Omphalea</i> p.p.	Euph.
<i>Callerya</i> p.p. (<i>Whitfordiodendron</i>)	Leg.	<i>Partenocissus</i>	Vit.
<i>Calospatha</i>	Palm.	<i>Passiflora</i>	Passifl.
<i>Canthium</i> p.p.	Rub.	<i>Petraeovitex</i>	Verb.
<i>Capparis</i> p.p.	Capp.	<i>Philbornea</i>	Linac.
<i>Cardiospermum</i> *	Sapind.	<i>Pisonia (aculeata)</i>	Nyctag.
<i>Cayratia</i>	Vit.	<i>Pisum</i> *	Leg.
<i>Ceratolobus</i>	Palm.	<i>Plectocomia</i>	Palm.
<i>Cissus</i>	Vit.	<i>Plectocomiopsis</i>	Palm.
<i>Clerodendrum</i> p.p.	Verb.	<i>Pogonotium</i>	Palm.
<i>Cucurbitaceae</i> p.p.	Cuc.	<i>Polyporandra</i> p.p.	Icacin.
<i>Daemonorops</i>	Palm.	<i>Pterisanthes</i>	Vit.
<i>Dalbergia</i> p.p.	Leg.	<i>Quisqualis</i>	Combr.
<i>Enkleia</i>	Thym.	<i>Randia</i> s.l. p.p.	Rub.
<i>Entada</i> p.p.	Leg.	<i>Rauwenhoffia</i>	Annon.
<i>Erythralium</i>	Olacac.	<i>Retispatha</i>	Palm.
<i>Flagellaria</i>	Flag.	<i>Rubus</i>	Rosac.
<i>Friesodielsia</i>	Annon.	<i>Sageretia</i> p.p.	Rhamn.
<i>Gloriosa</i>	Liliac.	<i>Smilax</i>	Liliac.
<i>Gouania</i>	Rhamn.	<i>Smythea</i> p.p.	Rhamn.
<i>Harrisonia</i>	Simar.	<i>Solanum</i> p.p.	Solan.
<i>Heterosmilax</i>	Liliac.	<i>Strychnos</i> p.p.	Logan.
<i>Holtrungia</i>	Passifl.	<i>Tetrastigma</i>	Vit.
<i>Hugonia</i>	Linac.	<i>Toddalia</i>	Rut.
<i>Illigera</i>	Hern.	<i>Uncaria</i>	Rub.
<i>Indorouchera</i>	Linac.	<i>Uvaria</i>	Annon.
<i>Iodes</i>	Icacin.	<i>Ventilago</i>	Rhamn.
<i>Jasminum</i> p.p.	Oleac.	<i>Vitis</i>	Vit.
<i>Korthalsia</i>	Palm.	<i>Willughbeia</i>	Apoc.
<i>Lantana</i> p.p.*	Verb.	<i>Zanthoxylum</i> p.p.	Rut.
<i>Lasiobema</i>	Leg.	<i>Zizyphus</i>	Rhamn.



Figure 5. Climbers without hooks / tendrils – a. *Dioscorea bulbifera* (twining left); b. *Dioscorea laurifolia* (twining right); c. *Rhipidophora korthalsii* (Arac.).

5. Climbers without hooks / tendrils — Fig. 5, 6a

Plants climbing by means of a twining stem, such as many *Leguminosae* and *Menispermaceae* or with adhesive roots as many *Araceae*, but without specialised climbing organs.

Taxon	Family	Taxon	Family
<i>Acacia</i> p.p.	Leg.	<i>Cyrtandra</i> p.p.	Gesn.
<i>Actinidia</i>	Actin.	<i>Dalbergia</i> p.p.	Leg.
<i>Aeschynanthus</i>	Gesn.	<i>Dalechampia</i>	Euph.
<i>Agalmyla</i>	Gesn.	<i>Deeringia</i>	Amaran.
<i>Aganope</i>	Leg.	<i>Derris</i>	Leg.
<i>Aganosma</i>	Apoc.	<i>Desmos</i> p.p.	Annon.
<i>Agatea</i>	Viol.	<i>Dichapetalum</i> p.p.	Dichap.
<i>Agelaea</i>	Connar.	<i>Dinochloa</i>	Gram.
<i>Aidiopsis</i>	Rub.	<i>Dioclea</i>	Leg.
<i>Airyantha</i>	Leg.	<i>Dioscorea</i>	Diosc.
<i>Alyxia</i>	Apoc.	<i>Diplectria</i>	Melast.
<i>Anomanthodia</i>	Rub.	<i>Dipodium scandens</i>	Orch.
<i>Anomianthus</i>	Annon.	<i>Ecdysanthera</i>	Apoc.
<i>Anredera</i>	Basell.	<i>Ellipeia</i>	Annon.
<i>Araceae</i> p.p.	Arac.	<i>Embelia</i> p.p.	Myrsin.
<i>Aristolochia</i>	Arist.	<i>Entada</i> p.p.	Leg.
<i>Asclepiadaceae</i> p.p.	Asclep.	<i>Epigynum</i>	Apoc.
<i>Aspidopteris</i>	Malp.	<i>Erycibe</i> p.p.	Conv.
<i>Bauhinia</i> p.p.	Leg.	<i>Euonymus</i> p.p.	Celastr.
<i>Berchemia</i> p.p.	Rhamn.	<i>Eustrephus</i>	Liliac.
<i>Bowringia</i>	Leg.	<i>Faradaya</i>	Verb.
<i>Bridelia</i> p.p.	Euph.	<i>Ficus</i> p.p.	Morac.
<i>Byttneria</i>	Sterc.	<i>Fissistigma</i>	Annon.
<i>Caesalpinia</i> p.p.	Leg.	<i>Freycinetia</i>	Pand.
<i>Callerya</i> (<i>Whitfordiodendron</i>)	Leg.	<i>Galeola</i>	Orch.
<i>Cansjera</i>	Opil.	<i>Garcinia</i> (SAN 77272)	Gutt.
<i>Cardiopteris</i>	Card.	<i>Gardneria</i>	Logan.
<i>Cassytha</i>	Laur.	<i>Geitonoplesium</i>	Liliac.
<i>Celastrus</i>	Celastr.	<i>Glossocarya</i>	Verb.
<i>Clematis</i>	Ranunc.	<i>Gnetum</i> p.p.	Gnet.
<i>Clitorea</i>	Leg.	<i>Gynochthodes</i>	Rub.
<i>Cnesmone</i>	Euph.	<i>Gynopachis</i>	Rub.
<i>Cnestis</i>	Connar.	<i>Hibbertia</i> p.p.	Dill.
<i>Coelospermum</i>	Rub.	<i>Hieris</i>	Bign.
<i>Combretum</i>	Combr.	<i>Hiptage</i>	Malp.
<i>Congea</i>	Verb.	<i>Hosea</i>	Verb.
<i>Connarus</i>	Connar.	<i>Hymenopyramis</i> (As)	Verb.
<i>Coptosapelta</i>	Rub.	<i>Illigera</i>	Hern.
<i>Crawfordia</i>	Gent.	<i>Ipomoea</i> p.p.	Conv.
<i>Creochiton</i>	Melast.	<i>Ischnocarpus</i>	Apoc.
<i>Croton caudatus</i> p.p.	Euph.	<i>Jacquemontia</i>	Conv.
<i>Cuscuta</i>	Conv.	<i>Jasminum</i> p.p.	Oleac.
<i>Cyathostemma</i>	Annon.		

(5. Climbers without hooks / tendrils, continued)

Taxon	Family	Taxon	Family
<i>Kadsura</i>	Schis.	<i>Phytocrene</i>	Icacin.
<i>Kunstleria</i>	Leg.	<i>Plagiopteron</i> (As)	Plag.
<i>Leuconotis</i>	Apoc.	<i>Polygala</i> p.p.	Polygal.
<i>Linostoma</i>	Thym.	<i>Polyporandra</i> p.p.	Icacin.
<i>Loeseneriella</i>	Celastr.	<i>Porana</i>	Conv.
<i>Lonicera</i>	Caprif.	<i>Pottsia</i>	Apoc.
<i>Lucinaea</i>	Rub.	<i>Premna</i> p.p.	Verb.
<i>Macrolenes</i>	Melast.	<i>Psychotria</i> p.p.	Rub.
<i>Macropsychanthus</i>	Leg.	<i>Pterococcus</i>	Euph.
<i>Maesa</i> p.p.	Myrsin.	<i>Pterolobium</i> *	Leg.
<i>Malaisia</i>	Morac.	<i>Pueraria</i>	Leg.
<i>Mastersia</i>	Leg.	<i>Pycnospora</i>	Leg.
<i>Maurandya</i> *	Scroph.	<i>Pyramidanthe</i>	Annon.
<i>Medinilla</i> p.p.	Melast.	<i>Pyrenacantha</i>	Icacin.
<i>Megistostigma</i>	Euph.	<i>Quisqualis</i>	Combr.
<i>Melodinus</i>	Apoc.	<i>Racemobambos</i>	Gram.
<i>Menispermaceae</i> p.p.	Menisp.	<i>Rhipogonum</i>	Liliac.
<i>Merremia</i>	Conv.	<i>Rhynchosia</i>	Leg.
<i>Micrechites</i>	Apoc.	<i>Rhyssopterys</i>	Malp.
<i>Mikania</i>	Comp.	<i>Rourea</i>	Connar.
<i>Millettia</i> p.p.	Leg.	<i>Roureopsis</i>	Connar.
<i>Miquelia</i>	Icacin.	<i>Sabia</i>	Sab.
<i>Mitrella</i>	Annon.	<i>Salacia</i>	Celastr.
<i>Monarthrocarpus</i>	Leg.	<i>Sarcodum</i>	Leg.
<i>Morinda</i> p.p.	Rub.	<i>Sarcostigma</i>	Icacin.
<i>Mucuna</i>	Leg.	<i>Scaevola oppositifolia</i>	Good.
<i>Muehlenbeckia</i>	Polygon.	<i>Schisandra</i>	Schis.
<i>Mussaenda</i> p.p.	Rub.	<i>Securidaca</i>	Polygal.
<i>Myxopyrum</i>	Oleac.	<i>Smythea</i> p.p.	Rhamn.
<i>Nastus</i>	Gram.	<i>Spatholirion</i>	Comm.
<i>Neodissochaeta</i>	Melast.	<i>Spatholobus</i>	Leg.
<i>Neosepicaea</i>	Bign.	<i>Sphenodesme</i>	Verb.
<i>Nyctocalos</i>	Bign.	<i>Stemona</i>	Stem.
<i>Omphalea</i> p.p.	Euph.	<i>Strongylodon</i>	Leg.
<i>Operculina</i>	Conv.	<i>Strophanthus</i>	Apoc.
<i>Opilia</i>	Opil.	<i>Symphorema</i>	Verb.
<i>Pachystylidium</i>	Euph.	<i>Tecomanthe</i>	Bign.
<i>Padbruggea</i>	Leg.	<i>Tephrosia</i>	Leg.
<i>Paederia</i>	Rub.	<i>Tetracera</i>	Dill.
<i>Palmeria</i>	Monim.	<i>Thunbergia</i>	Acanth.
<i>Pandorea</i>	Bign.	<i>Tournefortia</i>	Borag.
<i>Parsonsia</i>	Apoc.	<i>Trimenia macrura</i>	Trim.
<i>Parvatia</i> (As)	Lard.	<i>Tristellateia</i>	Malp.
<i>Pegia</i>	Anac.	<i>Urceola</i>	Apoc.
<i>Petraeovitex</i>	Verb.	<i>Vanilla</i>	Orch.
<i>Phylacium</i>	Leg.	<i>Vernonia</i> p.p.	Comp.
<i>Phyllanthus reticulatus</i>	Euph.	<i>Vigna</i>	Leg.

6. Climbers with opposite leaves — Fig. 6

Plants climbing, with or without tendrils or hooks, with opposite leaves, e.g. many *Apocynaceae*, *Asclepiadaceae* and *Bignoniaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aeschynanthus</i> p.p.	Gesn.	<i>Hiptage</i>	Malp.
<i>Agalmyla</i>	Gesn.	<i>Hosea</i>	Verb.
<i>Aganosma</i>	Apoc.	<i>Hydrangea</i> p.p.	Sax.
<i>Aidiopsis</i>	Rub.	<i>Hymenopyramis</i> (As)	Verb.
<i>Allaeophania</i>	Rub.	<i>Iodes</i>	Icacin.
<i>Alyxia</i> p.p.	Apoc.	<i>Ischnocarpus</i>	Apoc.
<i>Anomanthodia</i>	Rub.	<i>Jasminum</i> p.p.	Oleac.
<i>Aphaenandra</i>	Rub.	<i>Leuconotis</i>	Apoc.
<i>Artia</i>	Apoc.	<i>Levieria</i> p.p.	Monim.
<i>Asclepiadaceae</i> p.p.	Asclep.	<i>Linostoma</i>	Thym.
<i>Aspidopteris</i>	Malp.	<i>Lonicera</i>	Caprif.
<i>Caesalpinia oppositifolia</i>	Leg.	<i>Lucinaea</i>	Rub.
<i>Calycopteris</i>	Combr.	<i>Macrolenes</i>	Melast.
<i>Canthium</i> p.p.	Rub.	<i>Maurandya</i> *	Scroph.
<i>Catanthera</i>	Melast.	<i>Medinilla</i> p.p.	Melast.
<i>Chilocarpus</i>	Apoc.	<i>Melodinus</i>	Apoc.
<i>Chonemorpha</i>	Apoc.	<i>Micrechites</i>	Apoc.
<i>Clematis</i>	Ranunc.	<i>Mikania</i>	Comp.
<i>Coelospermum</i>	Rub.	<i>Morinda</i> p.p.	Rub.
<i>Combretum</i>	Combr.	<i>Mussaenda</i> p.p.	Rub.
<i>Congea</i>	Verb.	<i>Myxopyrum</i>	Oleac.
<i>Coptosapelta</i>	Rub.	<i>Naravelia</i>	Ranunc.
<i>Crawfurdia</i>	Gent.	<i>Neodissochaeta</i>	Melast.
<i>Creochiton</i>	Melast.	<i>Neosepicaea</i>	Bign.
<i>Cyrtandra</i> p.p.	Gesn.	<i>Paederia</i>	Rub.
<i>Dioscorea</i> p.p.	Diosc.	<i>Palmeria</i>	Monim.
<i>Diplectria</i>	Melast.	<i>Pandorea</i>	Bign.
<i>Dissochaeta</i>	Melast.	<i>Parabarium</i>	Apoc.
<i>Ecdysanthera</i>	Apoc.	<i>Parameria</i>	Apoc.
<i>Enkleia</i>	Thym.	<i>Parsonsia</i>	Apoc.
<i>Epigynum</i>	Apoc.	<i>Petraeovitex</i>	Verb.
<i>Euonymus</i> p.p.	Celastr.	<i>Plagiopteron</i> (As)	Plag.
<i>Fagraea</i> p.p.	Logan.	<i>Polyporandra</i>	Icacin.
<i>Faradaya</i>	Verb.	<i>Pottsia</i>	Apoc.
<i>Ficus</i> p.p.	Morac.	<i>Premna</i> p.p.	Verb.
<i>Garcinia</i> (SAN 77272)	Gutt.	<i>Psychotria</i> p.p.	Rub.
<i>Gardneria</i>	Logan.	<i>Quisqualis</i>	Combr.
<i>Gelsemium</i> p.p.	Logan.	<i>Rhynchodia</i>	Apoc.
<i>Glossocarya</i>	Verb.	<i>Rhyssopterys</i>	Malp.
<i>Gnetum</i> p.p.	Gnet.	<i>Salacia</i> p.p.	Celastr.
<i>Gynochthodes</i>	Rub.	<i>Saritaeta</i> *	Bign.
<i>Gynopachis</i>	Rub.	<i>Scaevola oppositifolia</i>	Good.
<i>Hieris</i>	Bign.	<i>Sphenodesme</i>	Verb.

(6. Climbers with opposite leaves, continued)

Taxon	Family	Taxon	Family
<i>Strophanthus</i>	Apoc.	<i>Trichopus</i>	Diosc.
<i>Strychnos</i> p.p.	Logan.	<i>Trimenia macrura</i>	Trim.
<i>Symphorema</i>	Verb.	<i>Tristellateia</i>	Malp.
<i>Tecomanthe</i>	Bign.	<i>Uncaria</i>	Rub.
<i>Thunbergia</i>	Acanth.	<i>Urceola</i>	Apoc.
<i>Tournefortia</i> p.p.	Borag.	<i>Urularia</i>	Apoc.
<i>Trachelospermum</i>	Apoc.	<i>Willughbeia</i>	Apoc.

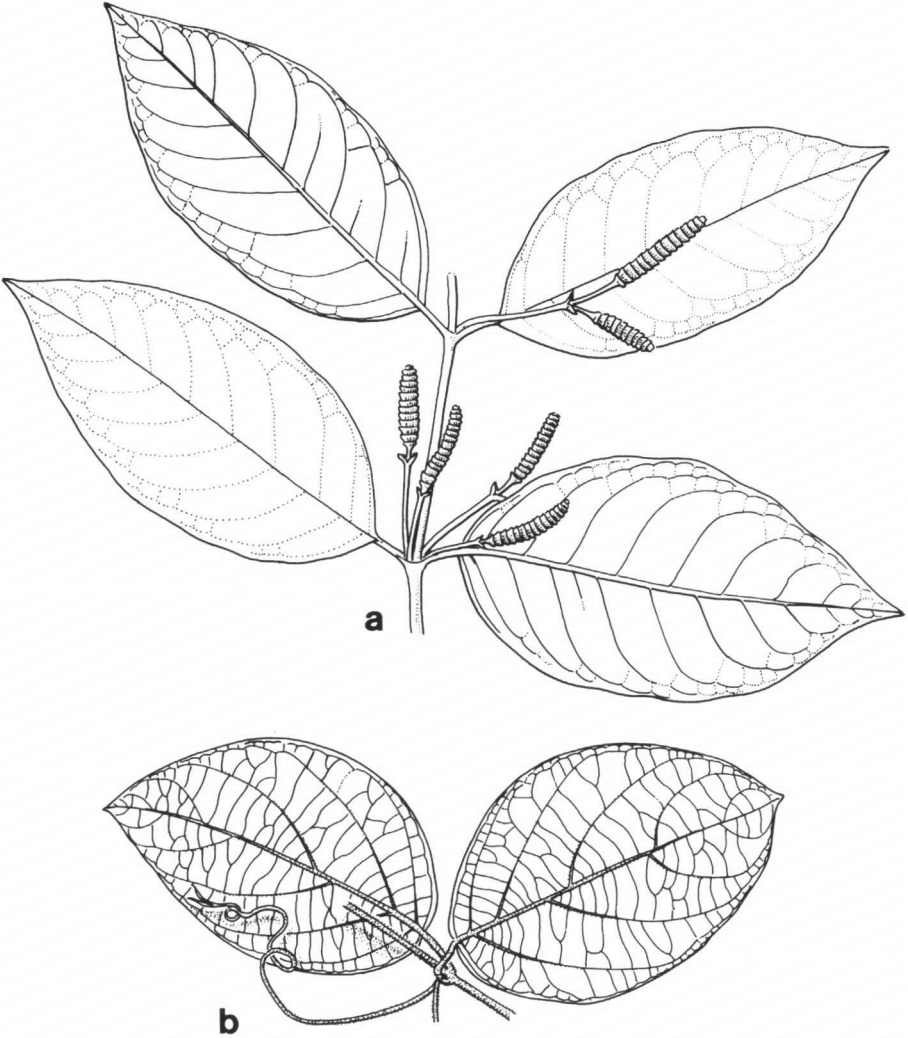


Figure 6. Climbers with opposite leaves – a. *Gnetum gnemonoides*; b. *Iodes cirrhosa*.

7. Echlorophyllose plants — Fig. 7 (see also Fig. 8a and 11a, p. 22 and 28)

Plants devoid of chlorophyll: either saprophytes such as *Triuridaceae* and the orchid genera *Aphyllorchis* and *Lecanorchis*, or holoparasites such as *Rafflesia* and *Balanophora*.

<i>Taxon</i>	<i>Family</i>
<i>Aeginetia</i>	Orob.
<i>Andresia</i>	Eric.
<i>Aphyllorchis</i>	Orch.
<i>Balanophora</i>	Balanoph.
<i>Burmannia</i> p.p.	Burm.
<i>Cassytha</i>	Laur.
<i>Christisonia</i>	Orob.
<i>Corsia</i>	Cors.
<i>Corybas</i> p.p.	Orch.
<i>Cotylanthera</i>	Gent.
<i>Cuscuta</i>	Conv.
<i>Cystorchis</i>	Orch.
<i>Didymoplexiella</i> (As)	Orch.
<i>Didymoplexis</i>	Orch.
<i>Epipogum</i>	Orch.
<i>Epirixanthes</i>	Polygal.
<i>Eulophia</i>	Orch.
<i>Exorhopala</i>	Balanoph.
<i>Galeola</i>	Orch.
<i>Gastrodia</i>	Orch.
<i>Gymnosiphon</i>	Burm.
<i>Hypopithys</i> (As)	Eric.
<i>Langsdorffia</i>	Raffl.
<i>Lecanorchis</i>	Orch.
<i>Mitrastemma</i>	Raffl.
<i>Monotropastrum</i>	Eric.
<i>Pachystoma</i>	Orch.
<i>Petrosavia</i>	Liliac.
<i>Rafflesia</i>	Raffl.
<i>Rhizanthus</i>	Balanoph.
<i>Rhopalocnemis</i>	Balanoph.
<i>Sapria</i>	Orch.
<i>Sciaphila</i>	Triur.
<i>Thismia</i>	Burm.



Figure 7. Echlorophyllose plants — *Sciaphila densiflora*.

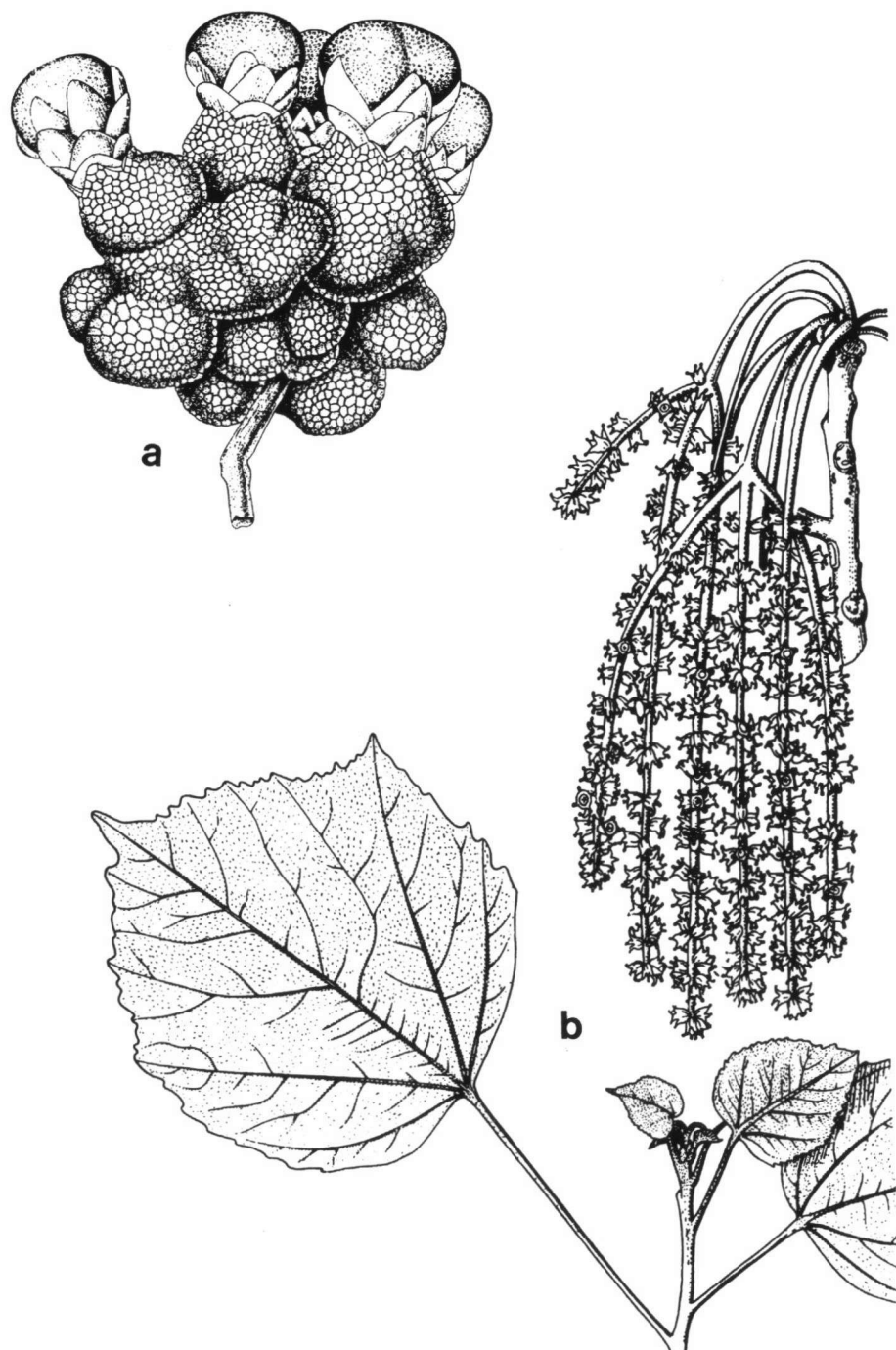
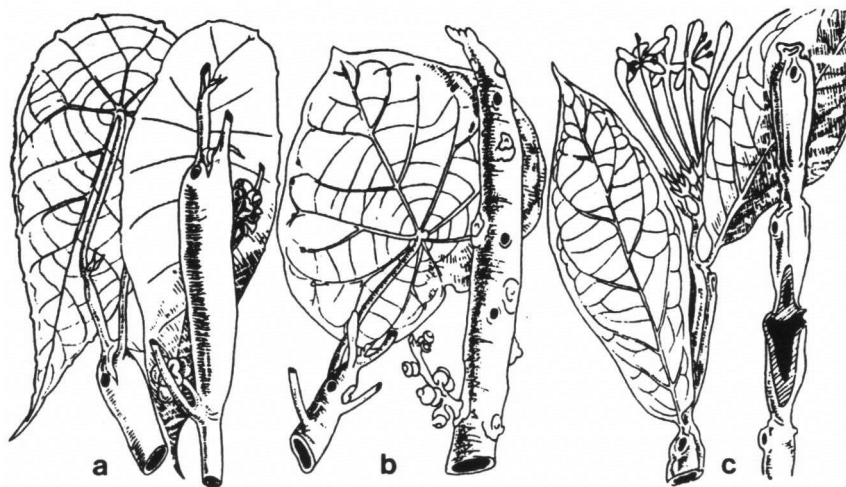


Figure 8. Leafless when flowering – a. *Balanophora fungosa* subsp. *indica*, b. *Tetrameles nudiflora*.

8. Leafless when flowering — Fig. 8

Plants without leaves when in flower, either because they are always leafless such as *Taeniophyllum* or *Sarcostemma* (l), or plants dropping their leaves before flowering such as *Tetrameles* and *Firmiana*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Amorphophallus</i>	Arac.	<i>Lannea</i> *	Anac.
<i>Balanophoraceae</i>	Balan.	<i>Mayodendron</i> p.p. (As)	Bign.
<i>Bombax</i>	Bomb.	<i>Parishia</i> p.p.	Anac.
<i>Catunaregam</i>	Rub.	<i>Parkia</i> p.p.	Leg.
<i>Chiloschista</i> (l)	Orch.	<i>Placellaria</i> (l) p.p.	Sant.
<i>Combretum</i>	Combr.	<i>Premna</i> p.p.	Verb.
<i>Crepis</i> p.p.	Comp.	<i>Radermachera</i> p.p.	Bign.
<i>Dalbergia</i> p.p.	Leg.	<i>Rafflesiaceae</i>	Raffl.
<i>Dillenia</i> p.p.	Dill.	<i>Remusatia</i>	Arac.
<i>Dipterocarpus</i> p.p.	Dipt.	<i>Sarcostemma</i> (l)	Asclep.
<i>Erythrina</i> p.p.	Leg.	<i>Shorea</i> p.p.	Dipt.
<i>Firmiana</i>	Sterc.	<i>Sterculia</i> p.p.	Sterc.
<i>Flacourtia</i> p.p.	Flac.	<i>Stereospermum</i>	Bign.
<i>Gardenia</i> p.p.	Rub.	<i>Symphorema</i> p.p.	Verb.
<i>Garuga</i>	Burs.	<i>Taeniophyllum</i> (l)	Orch.
<i>Gmelina</i> p.p.	Verb.	<i>Tectona</i>	Verb.
<i>Hildegardia</i>	Sterc.	<i>Terminalia</i> p.p.	Combr.
<i>Hymenodictyon</i>	Rub.	<i>Tetrameles</i>	Datisc.
<i>Itoa</i>	Flac.		



9. Ant plants — Fig. 9 (see also Fig. 2a, p. 10)

Plants that have special constructions providing housing for ants. Best known are the members of the *Hydnophytinae* with stems provided with a labyrinth of holes. Other well-known examples of ant-inhabited plants are species of *Endospermum* and *Macaranga*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acacia</i> p.p.	Leg.	<i>Hydnophytum</i>	Rub.
<i>Alpinia domatifera</i>	Zing.	<i>Kibara</i> p.p.	Monim.
<i>Amylothea formicaria</i>	Loranth.	<i>Korthalsia</i> p.p.	Palm.
<i>Anthorrhiza</i>	Rub.	<i>Macaranga</i> p.p.	Euph.
<i>Archidendron aruense</i>	Leg.	<i>Myristica myrmecophila</i>	Myrist.
<i>Chisocheton myrmecophilus</i>	Meliac.	<i>Myristica subalulata</i>	Myrist.
<i>Clerodendrum</i> p.p.	Verb.	<i>Myrmecodia</i>	Rub.
<i>Dischidia</i> p.p.	Asclep.	<i>Myrmeconuclea</i>	Rub.
<i>Drypetes myrmecophila</i>	Euph.	<i>Neonuclea</i> p.p.	Rub.
<i>Drypetes pendula</i>	Euph.	<i>Nepenthes bicalcarata</i>	Nepenth.
<i>Elaeocarpus myrmecophilus</i>	Elaeoc.	<i>Piper microphyllum</i>	Piper.
<i>Endospermum</i> p.p.	Euph.	<i>Psychotria myrmecophila</i>	Rub.
<i>Euroschinus</i>	Anac.	<i>Rinorea javanica</i>	Viol.
<i>Ficus</i> p.p.	Morac.	<i>Saurauia myrmecoidea</i>	Actin.
<i>Harpullia myrmecophila</i>	Sapind.	<i>Semecarpus aruensis</i>	Anac.
<i>Homalanthus fastuosus</i>	Euph.	<i>Stegantthera</i> p.p.	Monim.
<i>Hoya</i> p.p.	Asclep.	<i>Zanthoxylum myriacanthum</i>	Rut.

←

Figure 9. Ant plants — a. *Macaranga caladiifolii*; b. *Endospermum moluccanum*; c. *Clerodendrum fistulosum*; d. *Neonuclea superba*.



Figure 10. Schopfbäume – *Cycas rumphii* (drawn by Mrs. R.S. Keng).

10. Schopfbäume — Fig. 10

A German term for trees more or less shaped like an umbrella: unbranched or little branched and usually with large, crowded leaves. *Cycas* is a good example.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Agrostistachys</i>	Euph.	<i>Meliaceae</i> p.p.	Meliac.
<i>Anakasia</i>	Aral.	<i>Osmoxylon</i> p.p.	Aral.
<i>Barringtonia</i> p.p.	Lecyth.	<i>Palmae</i> p.p.	Palm.
<i>Carica</i> *	Caric.	<i>Pandanus</i>	Pand.
<i>Cordyline</i>	Liliac.	<i>Rubiaceae</i> p.p.	Rub.
<i>Cycas</i>	Cycad.	<i>Sararanga</i>	Pand.
<i>Dracaena</i>	Liliac.	<i>Schuurmansia</i>	Ochn.
<i>Eurycoma</i>	Simar.	<i>Semecarpus</i> p.p.	Anac.
<i>Harmsiopanax</i>	Aral.	<i>Sterculia</i> p.p.	Sterc.
<i>Jagera</i>	Sapind.	<i>Tapeinosperma</i>	Myrsin.
<i>Leea</i> p.p.	Leeac.		

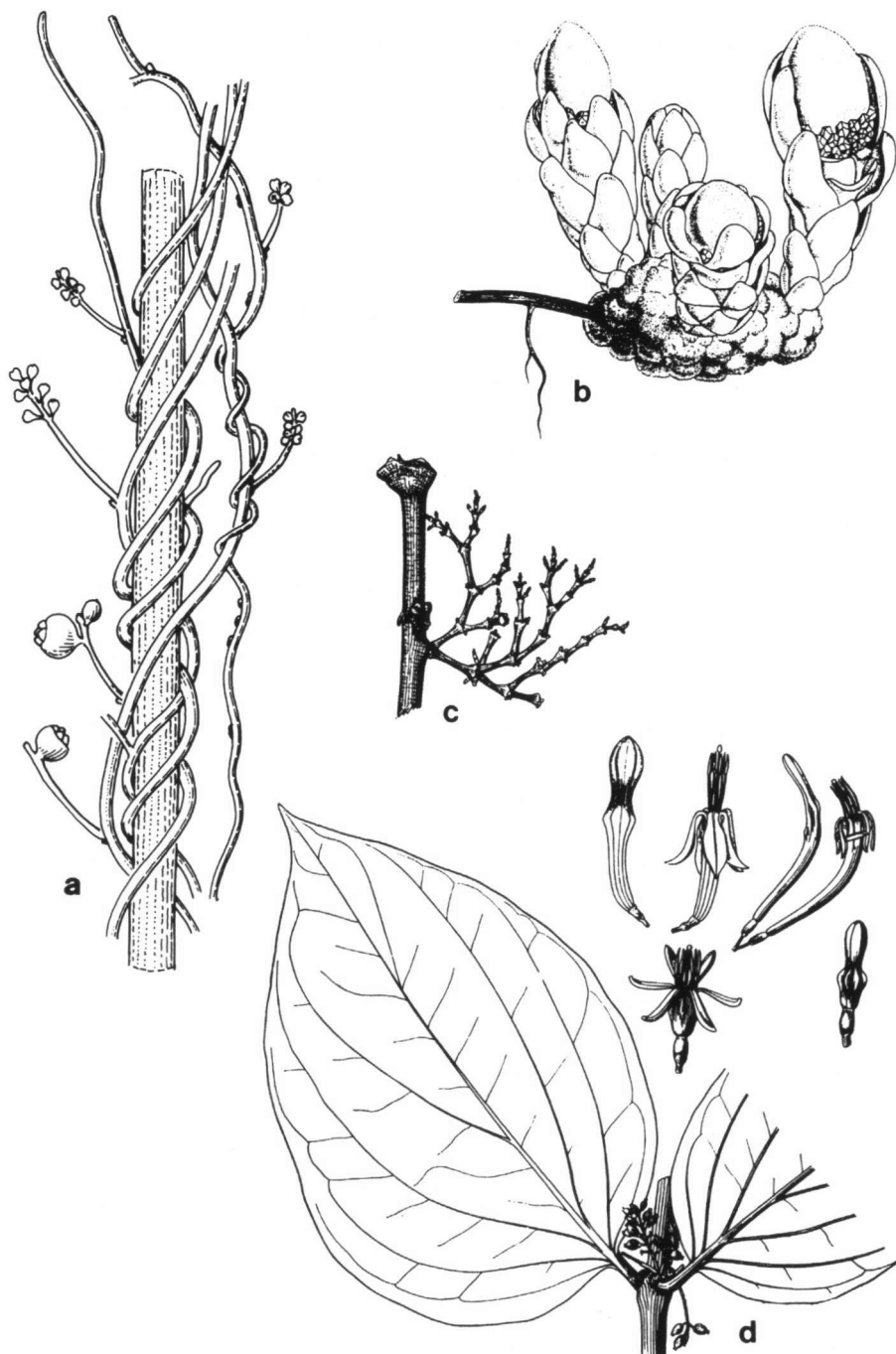


Figure 11. Parasites – a. *Cassytha filiformis*; b. *Balanophora fungosa* subsp. *fungosa*; c. *Viscum loranhi*; d. *Macrosolen curvinervis*.

11. Parasites — Fig. 11 (see also Fig. 8a, p. 22)

Plants depending in part or completely on other plants for their nutrients. Examples of the first are *Loranthaceae* and *Santalaceae*, of the second *Balanophoraceae* and *Rafflesiaceae*, i.e. holoparasites (h).

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aeginetia</i> (h)	Orob.	<i>Lepeostegeres</i>	Loranth.
<i>Amyema</i>	Loranth.	<i>Lepidaria</i>	Loranth.
<i>Amylotheca</i>	Loranth.	<i>Lepidella</i>	Loranth.
<i>Balanophora</i> (h)	Balanoph.	<i>Loxanthera</i>	Loranth.
<i>Barathranthus</i>	Loranth.	<i>Macrosolen</i>	Loranth.
<i>Buchnera</i>	Scroph.	<i>Mitrastemma</i> (<i>Mitrastemon</i>) (h)	Raffl.
<i>Cassytha</i> (h)	Laur.	<i>Notothixos</i>	Visc.
<i>Cecarria</i>	Loranth.	<i>Olacaceae</i> p.p.	Olacac.
<i>Christisonia</i> (h)	Orob.	<i>Opiliaceae</i> p.p.	Opil.
<i>Cladomyza</i>	Sant.	<i>Papuanthes</i>	Loranth.
<i>Cuscuta</i> (h)	Conv.	<i>Phacellaria</i>	Sant.
<i>Cyne</i>	Loranth.	<i>Rafflesia</i> (h)	Raffl.
<i>Dactyliophora</i>	Loranth.	<i>Rhizanthus</i> (h)	Raffl.
<i>Decaisnina</i>	Loranth.	<i>Rhizomonanthes</i>	Loranth.
<i>Dendromyza</i>	Sant.	<i>Rhopalocnemis</i> (h)	Balanoph.
<i>Dendrophthoe</i>	Loranth.	<i>Santalum</i>	Sant.
<i>Distrianthes</i>	Loranth.	<i>Scleropyrum</i>	Sant.
<i>Dufrenoya</i>	Sant.	<i>Scurulla</i>	Loranth.
<i>Elytranthe</i>	Loranth.	<i>Sogerianthe</i>	Loranth.
<i>Exocarpos</i>	Sant.	<i>Striga</i>	Scroph.
<i>Exorhopala</i> (h)	Balanoph.	<i>Taxillus</i>	Loranth.
<i>Ginalloa</i>	Visc.	<i>Tetradayas</i>	Loranth.
<i>Helixanthera</i>	Loranth.	<i>Thaumasianthes</i>	Loranth.
<i>Korthalsella</i>	Visc.	<i>Thesium</i>	Sant.
<i>Lampas</i>	Loranth.	<i>Trithecanthera</i>	Loranth.
<i>Langsdorffia</i> (h)	Balanoph.	<i>Viscum</i>	Visc.

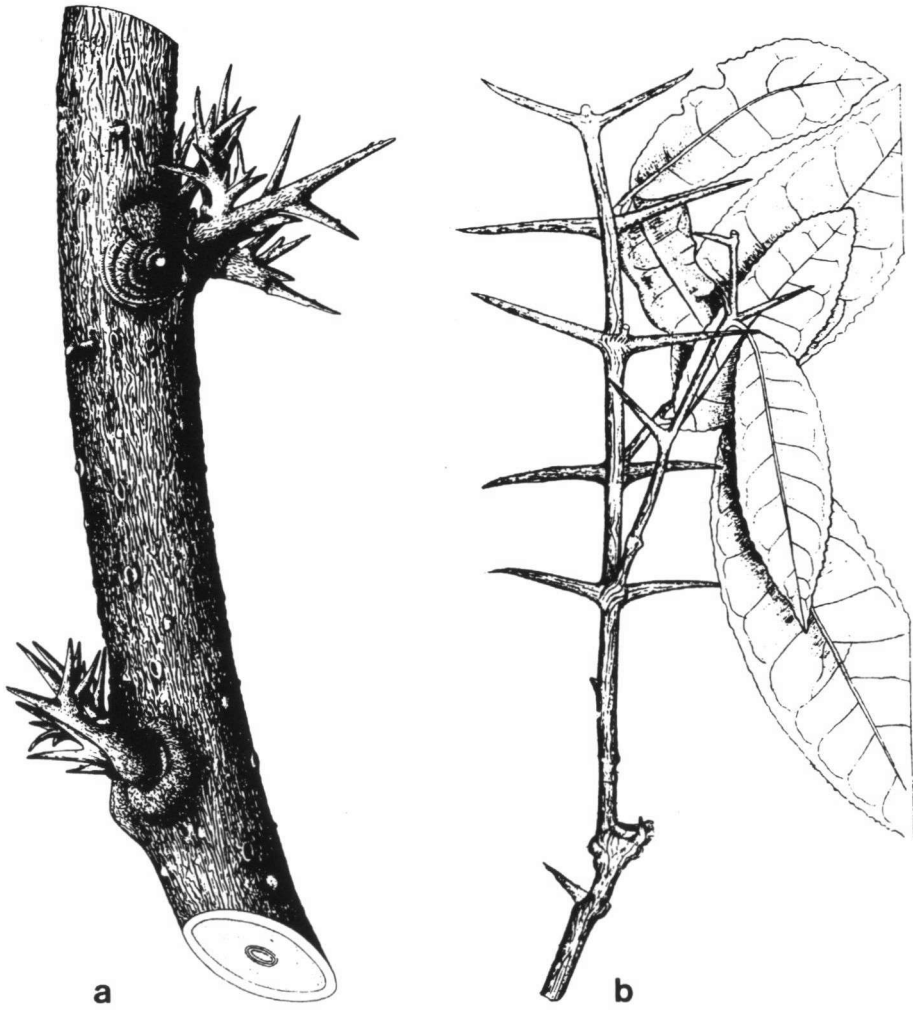


Figure 12. Armed plants – a. *Elaeagnus triflora*; b. *Paramignya longispina*.

12. Armed plants — Fig. 12 (see also Fig. 2a, p. 10)

Plants provided with thorns or spines. These can be derived from branches, stipules, or leaves. Some species are armed as juveniles and lose their thorns in the adult stage, e.g. *Cratoxylum sumatranum*.

Taxon	Family	Taxon	Family
<i>Acacia</i> p.p.	Leg.	<i>Dioscorea</i> p.p.	Diosc.
<i>Acanthopanax</i>	Aral.	<i>Diospyros montana</i>	Eben.
<i>Acanthophora</i>	Aral.	<i>Elaeagnus</i>	Elaeagn.
<i>Acanthus</i> p.p.	Acanth.	<i>Eleiodoxa</i>	Palm.
<i>Aegle</i>	Rut.	<i>Embelia</i> p.p.	Myrsin.
<i>Alangium salvifolium</i> p.p.	Alang.	<i>Erythrina</i> p.p.	Leg.
<i>Albizia</i> p.p.	Leg.	<i>Eugeissona</i>	Palm.
<i>Alternanthera</i> p.p.	Amaran.	<i>Euphorbia</i> p.p.	Euph.
<i>Amaranthus</i> p.p.	Amaran.	<i>Excoecaria indica</i>	Euph.
<i>Anthorrhiza</i>	Rub.	<i>Fagerlindia</i>	Rub.
<i>Aralia</i>	Aral.	<i>Fagraea crenulata</i>	Logan.
<i>Artabotrys hexapetalus</i> *	Annon.	<i>Feronia elephantum</i>	Rut.
<i>Atalantia</i>	Rut.	<i>Feroniella lucida</i>	Rut.
<i>Azima</i>	Salv.	<i>Ficus dens-echini</i>	Morac.
<i>Barleria</i> p.p.	Acanth.	<i>Flacourtia</i> p.p.	Flac.
<i>Berberis</i>	Berb.	<i>Gleditschia</i>	Leg.
<i>Bombax</i>	Bomb.	<i>Gmelina</i> p.p.	Verb.
<i>Borassus</i>	Palm.	<i>Harmsioplanax</i>	Aral.
<i>Brassaiopsis</i>	Aral.	<i>Harrisonia</i>	Simar.
<i>Bridelia</i> p.p.	Euph.	<i>Hemiscolopia</i>	Flac.
<i>Bursaria</i> *	Pitt.	<i>Hesperethusa crenulata</i>	Rut.
<i>Cactaceae</i> p.p.*	Cact.	<i>Hura</i> *	Euph.
<i>Caesalpinia</i> p.p.	Leg.	<i>Hydrolea spinosa</i>	Hydroph.
<i>Calamus</i>	Palm.	<i>Hymenocardia</i>	Euph.
<i>Calospatha</i>	Palm.	<i>Korthalsia</i>	Palm.
<i>Canthium</i> p.p.	Rub.	<i>Leea</i> p.p.	Leeac.
<i>Capparis</i>	Capp.	<i>Lepidium</i> p.p. (<i>Papuzilla</i>)	Cruc.
<i>Cassia javanica</i>	Leg.	<i>Licuala</i>	Palm.
<i>Cathormion</i>	Leg.	<i>Luvunga</i>	Rut.
<i>Catunaregam</i>	Rub.	<i>Maclura</i>	Morac.
<i>Ceiba</i> *	Bomb.	<i>Malpighia</i> *	Malp.
<i>Ceratolobus</i>	Palm.	<i>Merope</i>	Rut.
<i>Ceriscoides</i>	Rub.	<i>Metroxylon</i> p.p.	Palm.
<i>Citriobatus</i>	Pitt.	<i>Meyna</i>	Rub.
<i>Citrus</i> p.p.	Rut.	<i>Myrialepis</i>	Palm.
<i>Cleome</i> p.p.	Capp.	<i>Myrmecodia</i>	Rub.
<i>Combretum quadrangulare</i> (As)	Combr.	<i>Neoalsomitra</i> p.p.	Cuc.
<i>Cratoxylum formosum</i>	Gutt.	<i>Ola</i> p.p.	Olacac.
<i>Cycas</i> p.p.	Cycad.	<i>Oncosperma</i>	Palm.
<i>Daemonorops</i>	Palm.	<i>Oxyceros</i> p.p.	Rub.
<i>Dalbergia parviflora</i>	Leg.	<i>Paramignya</i>	Rut.
<i>Dichrostachys</i> p.p.	Leg.	<i>Parkinsonia</i> *	Leg.
		<i>Pholidocarpus</i>	Palm.

(12. Armed plants, continued)

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Pigafetta</i>	Palm.	<i>Scleropyrum</i>	Sant.
<i>Pisonia aculeata</i>	Nyctag.	<i>Scolopia</i>	Flac.
<i>Planchonella punctata</i> (As)	Sapot.	<i>Semecarpus bunburyanus</i>	Anac.
<i>Plectocomia</i>	Palm.	<i>Smilax</i> p.p.	Liliac.
<i>Plectocomiopsis</i>	Palm.	<i>Solanum</i> p.p.	Solan.
<i>Pogonotium</i>	Palm.	<i>Streblus</i> p.p.	Morac.
<i>Polyscias mollis</i>	Aral.	<i>Terminalia</i> p.p.	Combr.
<i>Protium</i>	Burs.	<i>Toddalia</i>	Rut.
<i>Pterolobium</i>	Leg.	<i>Trevesia</i>	Aral.
<i>Punica</i> p.p.*	Punic.	<i>Trifidacanthus</i>	Leg.
<i>Quisqualis</i> p.p.	Combr.	<i>Triphasia</i>	Rut.
<i>Retispatha</i>	Palm.	<i>Xanthophyllum</i> p.p.	Polygal.
<i>Salacca</i>	Palm.	<i>Ximenia</i>	Olacac.
<i>Salsola</i>	Chenop.	<i>Xylosma luzonense</i>	Flac.
<i>Saurauia</i> p.p.	Actin.	<i>Zanthoxylum</i>	Rut.
<i>Sauropus androgynus</i> p.p.	Euph.		

13. Bulbils

Plants provided with vegetative buds that act as diaspores. These are common in ferns but are also known in a few flowering plants. The best known example is probably *Remusatia vivipara*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Alpinia</i> p.p.	Zing.	<i>Kalanchoë</i>	Crass.
<i>Caldesia</i>	Alism.	<i>Nothoscordium</i>	Lilac.
<i>Dioscorea</i> p.p.	Diosc.	<i>Pentastemona</i>	Pentast.
<i>Furcraea</i> *	Liliac.	<i>Remusatia</i>	Arac.
<i>Globba</i> p.p.	Zing.	<i>Yucca</i> *	Liliac.

STEM OR BRANCH (characters 14–18)

14. Terminalia branching — Fig. 13

Branches with sympodial branching, i.e. growth at the top is arrested and elongation growth is continued from an axillary bud; well-known examples are *Baccaurea*, *Elaeocarpus* and *Terminalia*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Actinodaphne</i>	Laur.	<i>Palaquium</i>	Sapot.
<i>Alstonia</i>	Apoc.	<i>Pangium</i>	Flac.
<i>Baccaurea</i>	Euph.	<i>Parinari</i>	Chrys.
<i>Barringtonia</i>	Lecyth.	<i>Phoebe</i>	Laur.
<i>Beilschmiedia</i>	Laur.	<i>Pittosporum</i>	Pitt.
<i>Bombax</i>	Bomb.	<i>Pouteria</i>	Sapot.
<i>Campnosperma</i>	Anac.	<i>Rhizophoraceae</i> p.p.	Rhiz.
<i>Ceiba</i> *	Bomb.	<i>Rhodoleia</i>	Hamam.
<i>Celtis</i>	Ulm.	<i>Rubiaceae</i> p.p.	Rub.
<i>Elaeocarpus</i>	Elaeoc.	<i>Sapium</i>	Euph.
<i>Endospermum</i>	Euph.	<i>Sloanea</i>	Elaeoc.
<i>Fagraea</i>	Logan.	<i>Sterculia</i>	Sterc.
<i>Firmiana</i>	Sterc.	<i>Terminalia</i>	Combr.
<i>Gluta</i>	Anac.	<i>Tetractomia</i>	Rut.
<i>Leguminosae</i> p.p.	Leg.	<i>Theaceae</i> p.p.	Theac.
<i>Manilkara</i>	Sapot.	<i>Vavaea</i>	Meliac.

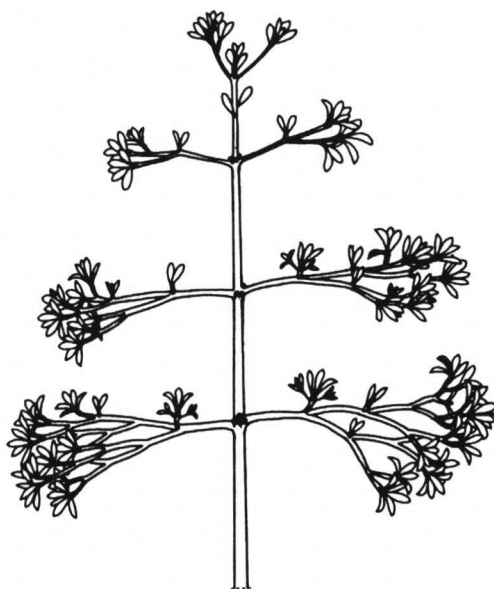


Figure 13. *Terminalia* branching. From Handb. Flora Papua New Guinea.



Fig. 14. Stem flanged – *Sphaeranthus africanus*. From Weeds of Rice fields.

15. Stem flanged — Fig. 14

Plants of which the stem or the branches are provided with longitudinal ridges or flanges. A good example is *Sphaeranthus*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Alsomitra suberosa</i>	Cuc.	<i>Heterostemma cuspidatum</i>	Asclep.
<i>Ammobium</i> *	Comp.	<i>Illigera</i> p.p.	Hern.
<i>Ardisia</i> p.p.	Myrsin.	<i>Lagdera</i>	Comp.
<i>Aristolochia crassinervia</i>	Arist.	<i>Lecananthus</i>	Rub.
<i>Axinandra alata</i>	Crypter.	<i>Lophopetalum sessilifolium</i>	Celastr.
<i>Bauhinia ridleyi</i>	Leg.	<i>Medinilla</i> p.p.	Melast.
<i>Cissus alata</i>	Vit.	<i>Memecylon</i> p.p.	Melast.
<i>Crotalaria</i> p.p.	Leg.	<i>Passiflora quadrangularis</i> *	Passifl.
<i>Cyrtandromoea</i>	Scroph.	<i>Phyllanthus</i> p.p.	Euph.
<i>Dioscorea</i> p.p.	Diosc.	<i>Poikilogyne</i> p.p.	Melast.
<i>Embelia</i> p.p.	Myrsin.	<i>Pternandra</i> p.p.	Melast.
<i>Eugenia</i> s.l. p.p.	Myrt.	<i>Pterocaulon</i>	Comp.
<i>Garcinia</i> p.p.	Gutt.	<i>Secamone elliptica</i>	Asclep.
<i>Glochidion</i> p.p.	Euph.	<i>Sphaeranthus</i>	Comp.
<i>Grangea</i>	Comp.	<i>Strobilanthes</i> p.p.	Acanth.

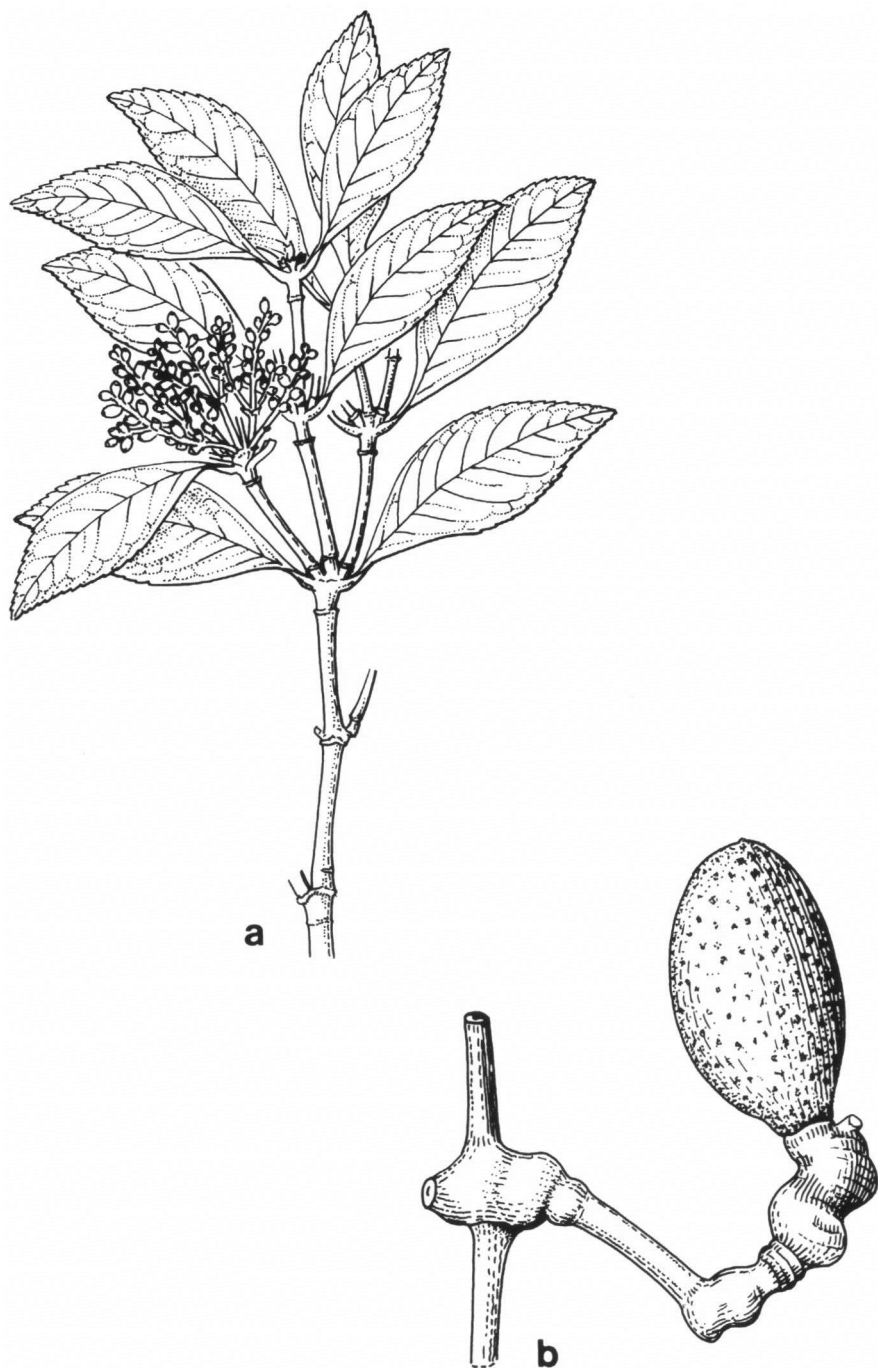


Figure 15. Swollen nodes – a. *Ascarina philippinensis*; b. *Gnetum gnemonoides*.

16. Swollen nodes — Fig. 6a, 15

Plants with branches or stems thickened at the nodes, such as in *Acanthaceae* and *Piperaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acalypha brachystachya</i>	Euph.	<i>Leea</i>	Leeac.
<i>Acalypha lanceolata</i>	Euph.	<i>Loranthaceae</i>	Loranth.
<i>Acanthaceae</i>	Acanth.	<i>Macrolenes</i> p.p.	Melast.
<i>Ascarina</i>	Chlor.	<i>Mallotus</i> p.p.	Euph.
<i>Avicennia</i>	Verb.	<i>Mirabilis</i> *	Nyctag.
<i>Axinandra</i>	Crypter.	<i>Peperomia</i>	Piper.
<i>Carallia</i>	Rhiz.	<i>Piper</i>	Piper.
<i>Chloranthus</i>	Chlor.	<i>Polygonum</i>	Polygon.
<i>Crypteronia</i>	Crypter.	<i>Pothomorphe</i> *	Piper.
<i>Dactylocladus</i>	Crypter.	<i>Pternandra</i>	Melast.
<i>Dissochaeta</i> p.p.	Melast.	<i>Sarcandra</i>	Chlor.
<i>Gnetum</i>	Gnet.	<i>Sonneratia</i>	Sonn.
<i>Gomphrena</i>	Amaran.	<i>Symingtonia</i>	Hamam.
<i>Gynotroches</i>	Rhiz.	<i>Thottea</i>	Arist.
<i>Hedyosmum</i>	Chlor.	<i>Viscaceae</i>	Visc.
<i>Impatiens</i>	Bals.	<i>Zippelia</i>	Piper.
<i>Iresine</i> *	Amaran.		



Figure 16. Serial buds – *Capparis zeylanica*.

17. Twigs white, petiole black

Plants when dried have pale twigs contrasting with the dark petioles, common in *Oleaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Alseodaphne</i> p.p.	Laur.	<i>Ilex</i> p.p.	Aquif.
<i>Beilschmiedia</i> p.p.	Laur.	<i>Kayea</i> p.p.	Guttif.
<i>Chionanthus</i> p.p.	Oleac.	<i>Olea</i> p.p.	Oleac.
<i>Corynocarpus</i>	Coryn.	<i>Pittosporum</i> p.p.	Pitt.
<i>Eugenia</i> s.l., p.p.	Myrt.		

18. Serial buds — Fig. 16

Plants with several superposed buds per axil instead of one as is normal. A good example is *Capparis quiniflora*. This list is very incomplete.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Agrostistachys indica</i>	Euph.	<i>Holrurgia</i>	Pass.
<i>Anisophyllea</i>	Rhiz.	<i>Lonicera</i>	Caprif.
<i>Capparis quiniflora</i>	Capp.	<i>Pithecellobium ellipticum</i>	Leg.
<i>Capparis zeylanica</i>	Capp.	<i>Plagiopteron</i> (As)	Plag.
<i>Chisocheton</i> p.p.	Meliac.	<i>Rubiaceae</i> p.p.	Rub.
<i>Connarus grandis</i>	Connar.		

EXUDATE (characters 19–22)

Many plants produce sap from wounds or cuts. Often this exudate is colourless or transparent, but in many species the exudate has a colour which may take some time to develop. Another character often invisible in the herbarium, but one that should be noted by the collector.

19. White or yellow sap

Many plants produce white (milky) sap, such as *Moraceae* and *Sapotaceae*. Yellow sap is common in *Guttiferae*. (Y) behind a name means that the sap is or can be yellow.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aglaia</i>	Meliac.	<i>Hura</i> *	Euph.
<i>Anacolosia</i> p.p.	Olacac.	<i>Lansium</i>	Meliac.
<i>Aphanamixis</i>	Meliac.	<i>Laurentia</i> *	Camp.
<i>Apocynaceae</i>	Apoc.	<i>Limnocharis</i>	Butom.
<i>Araceae</i> p.p.	Arac.	<i>Lobelia</i>	Lobel.
<i>Argemone</i> *	Papav.	<i>Maesa</i> (Y)	Myrsin.
<i>Asclepiadaceae</i>	Asclep.	<i>Mammea</i> (Y)	Gutt.
<i>Burseraceae</i> p.p.	Burs.	<i>Manihot</i> *	Euph.
<i>Calamus</i> (Y)	Palm.	<i>Mesua</i> (Y)	Gutt.
<i>Calophyllum</i> (Y)	Gutt.	<i>Moraceae</i>	Morac.
<i>Cardiopteris</i>	Card.	<i>Morinda</i> p.p.	Rub.
<i>Carica</i> *	Caric.	<i>Nymphaeaceae</i>	Nymph.
<i>Chisocheton</i> p.p.	Meliac.	<i>Ochanostachys</i>	Olacac.
<i>Codiaeum</i>	Euph.	<i>Omphalea</i>	Euph.
<i>Codonopsis</i>	Camp.	<i>Parishia</i> p.p.	Anac.
<i>Compositae</i> p.p.	Comp.	<i>Pimelodendron</i> (Y)	Euph.
<i>Convolvulaceae</i> p.p.	Conv.	<i>Pisonia umbelliflora</i>	Nyctag.
<i>Cratogeomys</i> (Y)	Gutt.	<i>Pleiogynium timoriense</i>	Anac.
<i>Daemonorops</i> (Y)	Palm.	<i>Prumnopitys ladei</i> (Au)	Conif.
<i>Diploclisia</i> (Y)	Menisp.	<i>Rhus</i> p.p.	Anac.
<i>Elateriospermum</i>	Euph.	<i>Rothmannia</i> p.p.	Rub.
<i>Euphorbia</i>	Euph.	<i>Salacia papuana</i>	Celastr.
<i>Excoecaria</i>	Euph.	<i>Sapium</i>	Euph.
<i>Fagraea</i> p.p.	Logan.	<i>Sapotaceae</i>	Sapot.
<i>Fibraurea</i> (Y)	Menisp.	<i>Stillingia</i>	Euph.
<i>Ficus</i> p.p. (Y)	Morac.	<i>Tenagocharis</i>	Butom.
<i>Garcinia</i> (Y)	Gutt.	<i>Thespesia</i> p.p.(Y)	Malv.
<i>Hevea</i> *	Euph.	<i>Tinomiscium</i> (Y)	Menisp.
<i>Homalanthus</i>	Euph.		

20. Black or brown sap

In most *Anacardiaceae* the sap is black or blackens upon exposure.

Taxon	Family	Taxon	Family
<i>Anacardium</i> *	Anac.	<i>Mangifera</i> p.p. (brown)	Anac.
<i>Androtium</i>	Anac.	<i>Melanochyla</i>	Anac.
<i>Ardisia</i> p.p.	Myrsin.	<i>Parishia</i> p.p.	Anac.
<i>Bouea</i> (brown)	Anac.	<i>Pegia</i>	Anac.
<i>Buchanania</i>	Anac.	<i>Pentaspadon</i> (brown)	Anac.
<i>Camposperma</i>	Anac.	<i>Pistacia</i>	Anac.
<i>Canarium</i> p.p.	Burs.	<i>Pleiogynium</i>	Anac.
<i>Dracontomelon</i>	Anac.	<i>Rhus</i> p.p.	Anac.
<i>Drimycarpus</i>	Anac.	<i>Semecarpus</i>	Anac.
<i>Euroschinus</i>	Anac.	<i>Spondias</i>	Anac.
<i>Gluta</i>	Anac.	<i>Swintonia</i>	Anac.
<i>Koordersiodendron</i>	Anac.	<i>Ternstroemia</i> p.p.(brown)	Theac.
<i>Lannea</i> *	Anac.	<i>Triomma</i> p.p.	Burs.

21. Red or orange sap

Most *Myristicaceae* have red sap; in some species the sap is transparent first and only turns red after hours of exposure, in others the sap is only very faintly reddish.

Taxon	Family	Taxon	Family
<i>Baloghia</i> (Au P)	Euph.	<i>Horsfieldia</i>	Myrist.
<i>Bischofia</i>	Euph.	<i>Inocarpus</i>	Leg.
<i>Bixa</i> *	Bix.	<i>Kalappia</i>	Leg.
<i>Borneodendron</i>	Euph.	<i>Knema</i>	Myrist.
<i>Callerya</i>	Leg.	<i>Macadamia</i>	Prot.
<i>Calophyllum</i> p.p.	Gutt.	<i>Macaranga</i> p.p.	Euph.
<i>Ceratopetalum succirubrum</i>	Cun.	<i>Millettia</i>	Leg.
<i>Claoxylon</i> p.p.	Euph.	<i>Myristica</i>	Myrist.
<i>Cochlospermum</i> p.p.	Cochl.	<i>Nephelium</i> p.p.	Sapind.
<i>Connarus</i> p.p.	Connar.	<i>Ostodes</i>	Euph.
<i>Cratoxylum</i> p.p.	Hyper.	<i>Pometia pinnata</i>	Sapind.
<i>Dalbergia</i>	Leg.	<i>Pterocarpus</i> p.p.	Leg.
<i>Dialium</i>	Leg.	<i>Reutealis</i>	Euph.
<i>Dysoxylum</i> p.p.	Meliac.	<i>Schizomeria serrata</i>	Cun.
<i>Endocomia</i>	Myrist.	<i>Stephania venosa</i>	Menisp.
<i>Endospermum</i> p.p.	Euph.	<i>Toona sureni</i>	Meliac.
<i>Fahrenheitia</i>	Euph.	<i>Trigonostemon</i>	Euph.
<i>Garcinia</i> p.p.	Gutt.	<i>Uvaria</i> p.p.	Annon.
<i>Gymnacranthera</i>	Myrist.	<i>Wetria</i>	Euph.

22. Dried plants resinous

When being dried some plants produce a resinous substance, in a few cases so much so that the specimens stick to the newspaper in which they are dried. It is best demonstrated by *Quintinia*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Agrostistachys</i>	Euph.	<i>Owenia</i> (Au)	Meliac.
<i>Anacardiaceae</i> p.p.	Anac.	<i>Phaleria</i> p.p.	Thym.
<i>Blumeodendron kurzii</i>	Euph.	<i>Pisonia</i> p.p.	Nyctag.
<i>Carallia</i>	Rhiz.	<i>Pteleocarpa</i> p.p.	Borag.
<i>Coffea</i> p.p.	Rub.	<i>Quintinia</i>	Sax.
<i>Combretocarpus</i>	Rhiz.	<i>Radermachera</i> p.p.	Bign.
<i>Combretum</i> p.p.	Combr.	<i>Rauvolfia</i> p.p.	Apoc.
<i>Dichilanthe</i>	Rub.	<i>Salacia</i> p.p.	Celastr.
<i>Dodonaea</i>	Sapind.	<i>Sarawakodendron</i>	Celastr.
<i>Elaeocarpus</i> p.p.	Elaeoc.	<i>Shorea</i> p.p.	Dipt.
<i>Fagraea</i> p.p.	Logan.	<i>Stemonurus</i> p.p.	Icacin.
<i>Garcinia</i> p.p.	Gutt.	<i>Syzygium vernicosum</i>	Myrt.
<i>Gardenia</i>	Rub.	<i>Theaceae</i> p.p.	Theac.
<i>Indorouchera</i>	Linac.	<i>Trimenia</i>	Trim.
<i>Lithocarpus</i> p.p.	Fagac.	<i>Vandopsis lissochiloides</i>	Orch.
<i>Mastixiodendron</i>	Rub.	<i>Viburnum</i> p.p.	Caprif.
<i>Nothofagus</i>	Fagac.		

SMELL (characters 23, 24)

Many plants have a distinctive smell when cut or when the leaves are crushed. *Prunus* smells of almonds, *Gaultheria* of salicylic acid, *Scorodocarpus* of garlic, *Elmerillia* is fragrant, *Xanthophyllum* smells of sugarcane, etc. Most smells, however, are not distinctive and I have only taken up two categories that are recognisable even on herbarium specimens.

23. Fenugreek

Plants with a smell of fenugreek, a common ingredient of soups. I often refer to them as 'Maggi plants'. Some herbarium specimens of *Mallotus* and *Polyscias* more than 100 years old still smell of fenugreek.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Anaphalis</i> p.p.	Comp.	<i>Grewia laevigata</i> (As)	Tiliac.
<i>Anthoxanthum</i> p.p.	Gram.	<i>Mallotus</i> p.p.	Euph.
<i>Aspidopteris</i> p.p.	Malp.	<i>Muehlenbergia</i> p.p.	Gram.
<i>Bromheadia</i> p.p.	Orch.	<i>Platea</i> p.p.	Icacin.
<i>Champereia</i>	Opil.	<i>Polyscias</i> p.p.	Aral.
<i>Corchorus trilocularis</i>	Tiliac.	<i>Ryparosa hullettii</i> (fr.)	Flac.
<i>Croton</i> p.p.	Euph.	<i>Sauropus</i> p.p.	Euph.
<i>Cyperus hyalinus</i>	Cyp.	<i>Umbelliferae</i> p.p.	Umb.
<i>Eupatorium</i> p.p.	Comp.	<i>Urobotrya siamensis</i>	Opil.

24. Foetid

Plants with a strong, disagreeable smell, often only noticeable after bruising the leaves and later disappearing in the herbarium. *Paederia foetida* is a good example. In some plants it is the flower that emits a foul smell, e.g. many *Araceae*. In that case (fl.) is added behind the name of the taxon.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Araceae</i> p.p.(fl.)	Arac.	<i>Hibbertia scandens</i>	Dill.
<i>Aristolochia</i> (fl.)	Arist.	<i>Lasianthus</i> p.p.	Rub.
<i>Cassia</i> p.p.	Leg.	<i>Paederia</i> p.p.	Rub.
<i>Celtis cinnamomea</i>	Ulm.	<i>Polyalthia</i> p.p.	Annon.
<i>Chisocheton</i> p.p.	Meliac.	<i>Premna foetida</i>	Verb.
<i>Cyathocalyx</i> p.p. (fl.)	Annon.	<i>Rafflesiaceae</i> (fl.)	Raffl.
<i>Dendrobium</i> p.p.(fl.)	Orch.	<i>Saprosma</i>	Rub.
<i>Dysoxylum</i> p.p.	Meliac.	<i>Toona</i>	Meliac.
<i>Eryngium</i> *	Umb.		

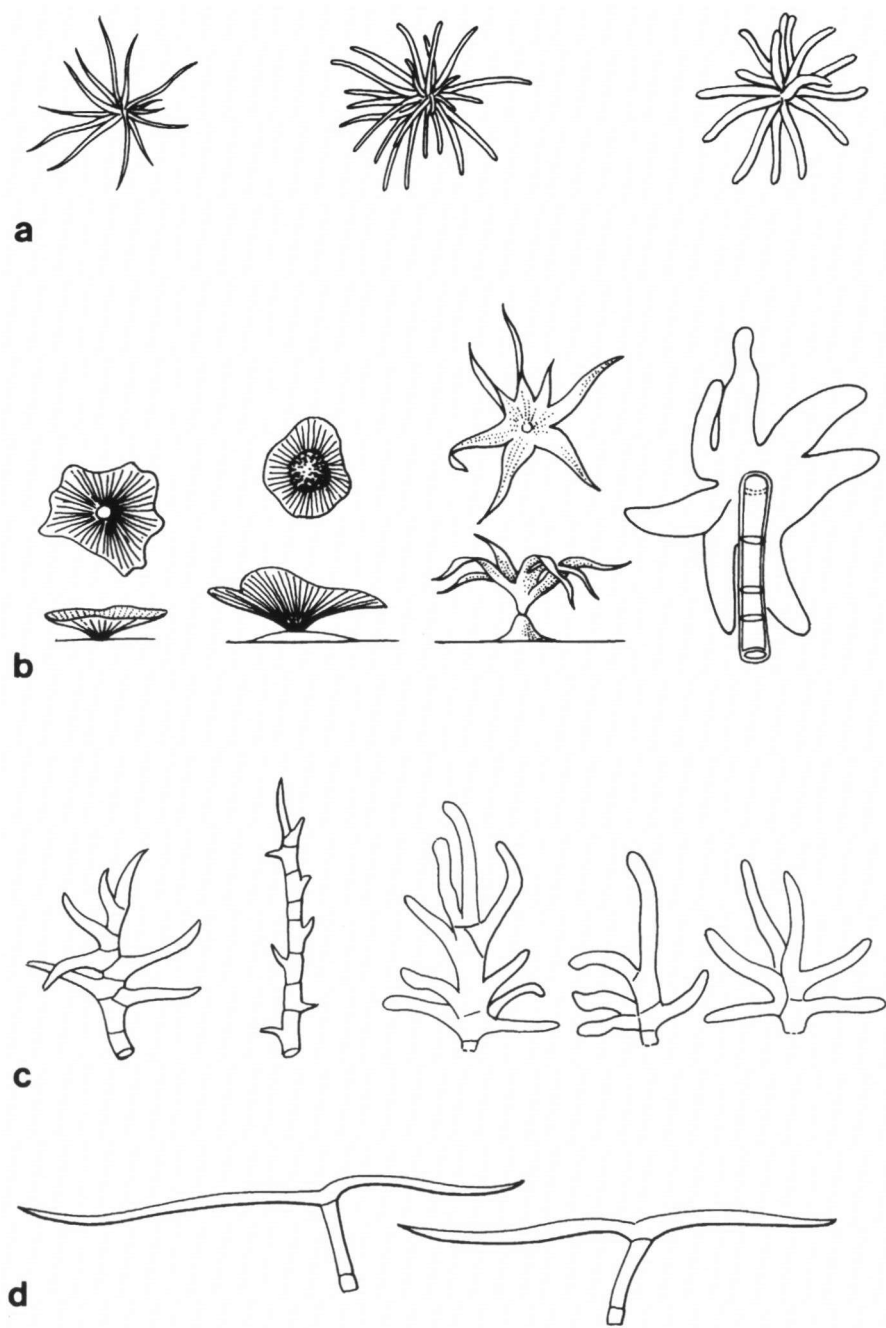


Figure 17. Indument – a. Stellate hairs; b. scales; c. dendroid hairs; d. hairs balance- or T-shaped.

INDUMENT (characters 25–30)

25. Stellate hairs — Fig. 17a

Plants of which the hairs are arranged in starshaped bundles. Very common in *Euphorbiaceae* and *Sterculiaceae*. In *Dipterocarpaceae* the hairs are often grouped in tufts. These are not regarded as true stellate hairs.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aglaia</i> p.p.	Meliac.	<i>Haplophragma adenophyllum</i> (As)	Bign.
<i>Alangium</i> p.p.	Alang.	<i>Heterophragma sulfureum</i> (As)	Bign.
<i>Aleurites</i>	Euph.	<i>Homonoia</i>	Euph.
<i>Alphandia</i>	Euph.	<i>Hydnocarpus</i> p.p.	Flac.
<i>Aphanamixis</i>	Meliac.	<i>Hydrangea</i>	Sax.
<i>Astronia</i> p.p.	Melast.	<i>Ipomoea</i> p.p.	Conv.
<i>Baccaurea</i>	Euph.	<i>Jacquemontia</i> p.p.	Conv.
<i>Bombax</i> p.p.	Bomb.	<i>Koilocarpus</i>	Euph.
<i>Borneodendron</i>	Euph.	<i>Lagerstroemia</i>	Lythr.
<i>Buddleja</i>	Logan.	<i>Lannea</i> *	Anac.
<i>Caldcluvia</i> p.p.	Cun.	<i>Lunasia amara</i>	Rut.
<i>Callicarpa</i>	Verb.	<i>Macrolenes</i>	Melast.
<i>Campnosperma</i> p.p.	Anac.	<i>Mallotus</i> p.p.	Euph.
<i>Capparis</i> p.p.	Capp.	<i>Malvaceae</i> p.p.	Malv.
<i>Catanthera</i>	Melast.	<i>Medinilla</i>	Melast.
<i>Cephalomappa</i>	Euph.	<i>Melanolepis</i>	Euph.
<i>Chisocheton</i> p.p.	Meliac.	<i>Melodorum</i>	Annon.
<i>Chrozophora</i>	Euph.	<i>Neotrewia</i>	Euph.
<i>Cladogynos</i>	Euph.	<i>Olearia</i>	Comp.
<i>Clethra</i> p.p.	Clethr.	<i>Osmoxylon</i> p.p.	Aral.
<i>Creochiton</i>	Melast.	<i>Pachystylidium</i>	Euph.
<i>Croton</i>	Euph.	<i>Paederia foetida</i>	Rub.
<i>Ctenolophon</i>	Linac.	<i>Palmeria</i>	Monim.
<i>Cyathocalyx</i> p.p.	Annon.	<i>Pellacalyx</i>	Rhiz.
<i>Dacryodes nervosa</i>	Burs.	<i>Piriqueta</i> *	Turn.
<i>Deutzia</i>	Sax.	<i>Plagiopteron</i> (As)	Plag.
<i>Dicoelia</i>	Euph.	<i>Platea</i>	Icacin.
<i>Diospyros</i> p.p.	Eben.	<i>Rauwenhoffia</i>	Annon.
<i>Dissochaeta</i>	Melast.	<i>Reutealis</i>	Euph.
<i>Distylium</i>	Hamam.	<i>Rhododendron</i> p.p.	Eric.
<i>Doryxylon</i>	Euph.	<i>Rhodoleia</i>	Hamam.
<i>Elaeagnus triflora</i>	Elaeag.	<i>Salvia</i> p.p.	Lab.
<i>Endospermum</i>	Euph.	<i>Sapindaceae</i> p.p.	Sapind.
<i>Epiprinus</i>	Euph.	<i>Saurauia</i> p.p.	Actin.
<i>Eremophila</i> (Au)	Myopor.	<i>Schefflera</i> p.p.	Aral.
<i>Erycibe</i> p.p.	Conv.	<i>Semecarpus</i> p.p.	Anac.
<i>Erythrina variegata</i>	Leg.	<i>Senecio</i>	Comp.
<i>Eucalyptus</i> p.p.	Myrt.	<i>Shorea</i> p.p.	Dipt.
<i>Fahrenheitia</i>	Euph.	<i>Solanum</i> p.p.	Solan.
<i>Flindersia</i>	Rut.	<i>Sterculiaceae</i> p.p.	Sterc.
<i>Gomphostemma</i>	Lab.	<i>Styrax</i> p.p.	Styr.

(25. Stellate hairs, continued)

Taxon	Family	Taxon	Family
<i>Sumbaviopsis</i>	Euph.	<i>Trigonobalanus</i>	Fagac.
<i>Sycopsis</i>	Hamam.	<i>Uvaria</i>	Annon.
<i>Tetrapanax</i> * (As)	Aral.	<i>Viburnum</i> p.p.	Caprif.
<i>Tiliaceae</i>	Tiliac.	<i>Vitex</i>	Verb.
<i>Trewia</i>	Euph.		

26. Scales — Fig. 17b

Indument consists of round disks attached in the middle. Very common in *Durio*, *Elaeagnus* and *Rhododendron*.

Taxon	Family	Taxon	Family
<i>Aglaia</i> p.p.	Meliac.	<i>Heritiera</i>	Sterc.
<i>Aleurites</i>	Euph.	<i>Hibbertia</i>	Dill.
<i>Alphitonia</i>	Rhamn.	<i>Hibiscus</i> p.p.	Malv.
<i>Ancistrocladus</i>	Ancistr.	<i>Homonioia</i>	Euph.
<i>Anisoptera</i> p.p.	Dipt.	<i>Hymenocardia</i>	Euph.
<i>Ardisia</i> p.p.	Myrsin.	<i>Lunasia</i>	Rut.
<i>Astronia</i> p.p.	Melast.	<i>Macaranga</i> p.p.	Euph.
<i>Berchemia</i>	Rhamn.	<i>Mallotus</i> p.p.	Euph.
<i>Bixa</i> *	Bixac.	<i>Microcos</i>	Tiliac.
<i>Brownlowia</i>	Tiliac.	<i>Myrica</i>	Myric.
<i>Bruinsmia</i>	Styr.	<i>Myristica</i> p.p.	Myrist.
<i>Callicarpa</i>	Verb.	<i>Neesia</i>	Bomb.
<i>Campnosperma</i>	Anac.	<i>Nothofagus</i>	Fagac.
<i>Camptostemon</i>	Bomb.	<i>Octomeles</i>	Datisc.
<i>Castanopsis</i>	Fagac.	<i>Palaquium</i> p.p.	Sapot.
<i>Cephalomappa</i>	Euph.	<i>Parinari</i> p.p.	Chrys.
<i>Chrozophora</i>	Euph.	<i>Payena</i> p.p.	Sapot.
<i>Chrysophyllum</i>	Sapot.	<i>Pentace</i>	Tiliac.
<i>Cleistanthus</i> p.p.	Euph.	<i>Piriqueta</i> *	Turn.
<i>Clerodendrum</i>	Verb.	<i>Planchonella</i> p.p.	Sapot.
<i>Coelostegia</i>	Bomb.	<i>Platea</i>	Icacin.
<i>Combretocarpus</i>	Rhiz.	<i>Procris</i>	Urt.
<i>Combretum</i>	Combr.	<i>Pterospermum</i>	Sterc.
<i>Croton</i>	Euph.	<i>Quintinia</i>	Sax.
<i>Ctenolophon</i>	Linac.	<i>Raphiolepis</i>	Rosac.
<i>Deutzia</i>	Sax.	<i>Rhododendron</i>	Eric.
<i>Diplodiscus</i>	Tiliac.	<i>Schleichera</i>	Sapind.
<i>Dissochaeta</i> p.p.	Melast.	<i>Schoutenia</i>	Tiliac.
<i>Distylium</i>	Hamam.	<i>Styrax</i> p.p.	Styr.
<i>Dodonaea</i>	Sapind.	<i>Sumbaviopsis</i>	Euph.
<i>Durio</i>	Bomb.	<i>Sycopsis</i>	Hamam.
<i>Elaeagnus</i>	Elaeag.	<i>Thespesia</i>	Malv.
<i>Engelhardia</i>	Jugl.	<i>Trichospermum</i>	Tiliac.
<i>Galbulimima</i>	Himant.	<i>Villebrunea</i>	Urt.
<i>Ganophyllum</i>	Sapind.	<i>Vitex</i>	Verb.
<i>Grewia</i>	Tiliac.		

27. Dendroid hairs — Fig. 17c

Plants in which the hairs resemble miniature trees. Not a very common indument type. *Erycibe* is a genus in which this type of hair is common.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Callicarpa</i> p.p.	Verb.	<i>Lagerstroemia</i> p.p.	Lythr.
<i>Connarus</i> p.p.	Connar.	<i>Melastoma</i>	Melast.
<i>Dioscorea</i> p.p.	Diosc.	<i>Myristica</i>	Myrist.
<i>Erycibe</i> p.p.	Conv.	<i>Platea</i> p.p.	Icac.
<i>Euphorbiaceae</i> p.p.	Euph.	<i>Premna</i> p.p.	Verb.
<i>Indigofera</i>	Leg.	<i>Scurulla</i> p.p.	Loranth.
<i>Knema</i>	Myrist.	<i>Vatica</i> p.p.	Dipt.

28. Balance hairs — Fig. 17d

Hairs not attached at base but somewhere along its length. In lateral view, these hairs are T-shaped or resemble a balance, hence the name; common in *Sapotaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Callicarpa</i> p.p.	Verb.	<i>Mastixia</i> p.p.	Corn.
<i>Dioscoreaceae</i> p.p.	Diosc.	<i>Munronia</i> p.p.	Meliac.
<i>Helicia</i>	Prot.	<i>Pittosporum</i> p.p.	Pitt.
<i>Icacinaeae</i> p.p.	Icacin.	<i>Premna</i> p.p.	Verb.
<i>Indigofera</i> p.p.	Leg.	<i>Ryparosa</i>	Flac.
<i>Litchi</i>	Sapind.	<i>Sapotaceae</i> p.p.	Sapot.
<i>Malpighiaceae</i> p.p.	Malp.		

29. Stinging hairs

Plants provided either with sharp needle-shaped hairs that cause mechanical irritation of the skin, e.g. hairs of *Mucuna* and Bamboo, or nettle hairs such as in *Urticaceae* where irritation is mainly caused by chemical substances. In a few cases (*Brachychiton*, *Neesia*) stinging hairs surround the seeds; these are indicated by (fr.).

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Abroma</i>	Sterc.	<i>Laportea</i> p.p.	Urt.
<i>Bambusoideae</i> p.p.	Gram.	<i>Macaranga</i> p.p.	Euph.
<i>Brachychiton</i> (fr.)	Sterc.	<i>Megistostigma</i>	Euph.
<i>Cnesmone</i>	Euph.	<i>Mucuna</i>	Leg.
<i>Dendrocnide</i>	Urt.	<i>Neesia</i> (fr.)	Bomb.
<i>Ficus</i> p.p.	Morac.	<i>Pachystylidium</i>	Euph.
<i>Fleurya</i> p.p.	Urt.	<i>Phytocrene</i>	Icacin.
<i>Girardinia</i>	Urt.	<i>Urtica</i>	Urt.
<i>Jagera</i>	Sapind.		

30. Leaves glaucous

Many plants have leaves that are whitish or greenish underneath, caused by a waxy substance. When held against fire the wax melts. Very common in *Lauraceae*.

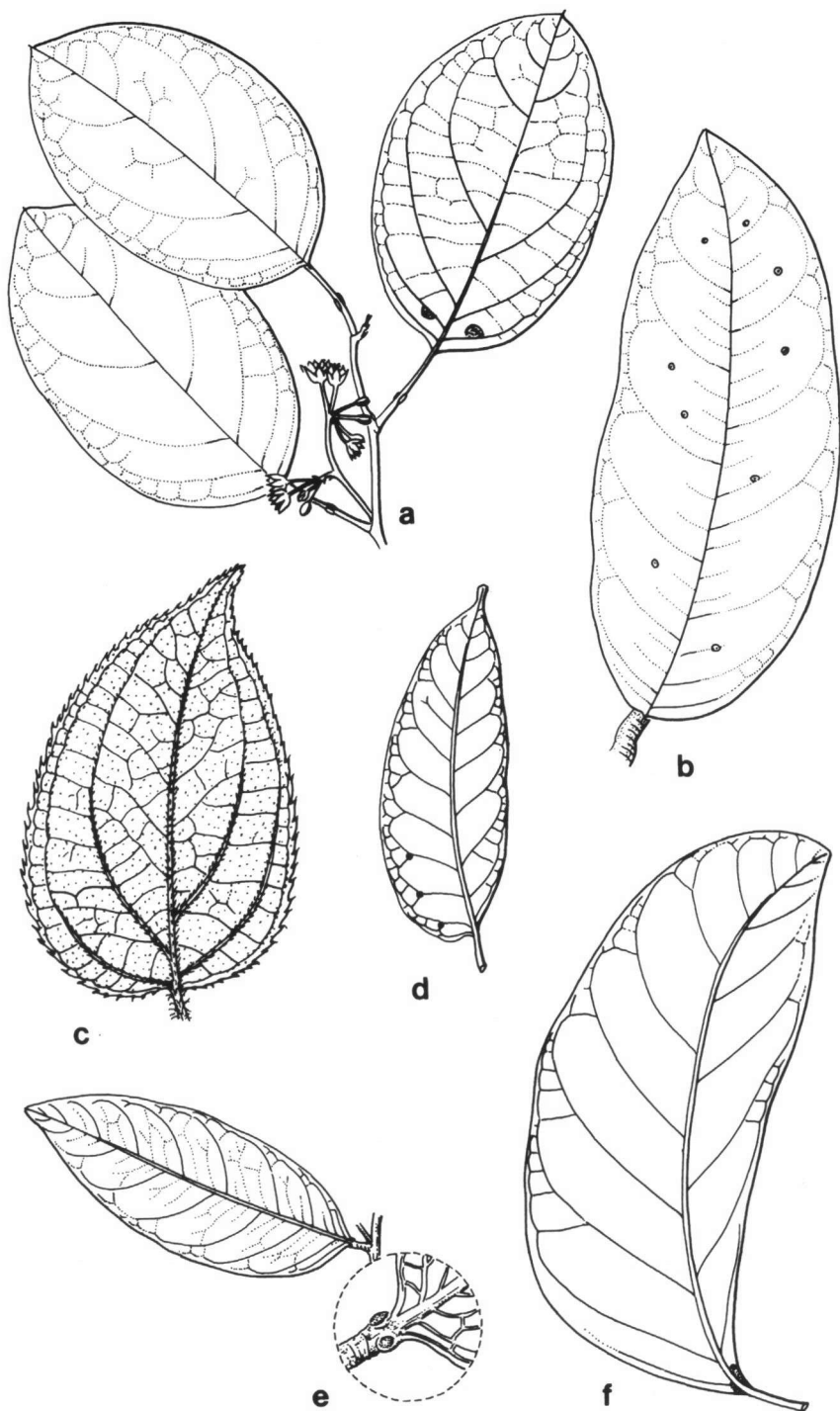
<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Alphitonia</i>	Rhamn.	<i>Lauraceae</i> p.p.	Laur.
<i>Anacardiaceae</i> p.p.	Anac.	<i>Leguminosae</i> p.p.	Leg.
<i>Annonaceae</i> p.p.	Annon.	<i>Magnoliaceae</i> p.p.	Magn.
<i>Daphniphyllum</i>	Daphn.	<i>Menispermaceae</i> p.p.	Menisp.
<i>Dipterocarpaceae</i> p.p.	Dipt.	<i>Myristica</i> p.p.	Myrist.
<i>Drimys</i> p.p.	Wint.	<i>Rhamnus</i> p.p.	Rhamn.
<i>Elaeocarpaceae</i> p.p.	Elaeoc.	<i>Rubiaceae</i> p.p.	Rub.
<i>Euphorbiaceae</i> p.p.	Euph.	<i>Sapindaceae</i> p.p.	Sapind.
<i>Eupomatia</i>	Eupom.	<i>Smilax</i>	Liliac.
<i>Fagaceae</i> p.p.	Fagac.	<i>Trigoniasstrum</i>	Trigon.
<i>Hamamelidaceae</i> p.p.	Hamam.	<i>Zygogynum</i>	Wint.
<i>Knema</i>	Myrist.		

LEAVES WITH GLANDS (character 31)

31. Glands on petiole (p) or lamina (l) — Fig. 18

Many plants have glands, on the petiole (p) or on the lamina (l), either on the underside or, more rarely, on the upperside. These glands are of a different type, e. g. crateriform glands of *Quassia* and *Xanthophyllum*, large flat black glands of *Prunus*, small scattered glands of *Myxopyrum*, pearl-glands of some *Macaranga* and *Flemingia*. Where no (p) or (l) is added the glands occur on both petiole and lamina or between the two.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acacia</i> p.p.	Leg.	<i>Elateriospermum</i> (l)	Euph.
<i>Adenia</i> (p)	Passifl.	<i>Endospermum peltatum</i>	Euph.
<i>Aegialitis</i>	Plumb.	<i>Eriandra</i> (l)	Polygal.
<i>Ahernia</i> (p)	Flac.	<i>Erythrina</i>	Leg.
<i>Ailanthus</i> (l)	Simar.	<i>Fagraea racemosa</i> (l)	Logan.
<i>Alchornea</i> (p)	Euph.	<i>Fahrenheitia</i> (p)	Euph.
<i>Anacolosa</i> p.p.	Olacac.	<i>Faradaya</i> (l)	Verb.
<i>Ancistrocladus</i> (l)	Ancistr.	<i>Fernandoa</i> (l)	Bign.
<i>Anneslea</i> (l)	Theac.	<i>Ficus</i> p.p.	Morac.
<i>Aporosa</i>	Euph.	<i>Flemingia</i> (l)	Leg.
<i>Archidendron</i> (p)	Leg.	<i>Gaultheria</i> (l)	Eric.
<i>Ashtonia</i> (l)	Euph.	<i>Gmelina</i> (l)	Verb.
<i>Atylosia</i> (l)	Leg.	<i>Gonystylus</i> (l)	Thym.
<i>Baccaurea bracteata</i> (l)	Euph.	<i>Hemisclopiopsis</i> (p)	Flac.
<i>Bennettiodendron</i> (p)	Flac.	<i>Heynea</i> (l)	Meliac.
<i>Blastus</i> (l)	Melast.	<i>Hibiscus</i> (l)	Malv.
<i>Blumeodendron</i>	Euph.	<i>Hollrungia</i>	Passifl.
<i>Bucea</i> p.p. (l)	Simar.	<i>Homalium</i>	Flac.
<i>Bruguiera</i> (l)	Rhiz.	<i>Horsfieldia</i> p.p. (l)	Myrist.
<i>Cajanus</i> (l)	Leg.	<i>Hosea</i> (l)	Verb.
<i>Callicarpa</i> (l)	Verb.	<i>Hymenocardia</i> (l)	Euph.
<i>Carallia</i> (l)	Rhiz.	<i>Ilex</i> p.p.	Aquif.
<i>Chilocarpus</i> (l)	Apoc.	<i>Itoa</i> (l)	Flac.
<i>Chondrostylis</i> (p)	Euph.	<i>Jasminum</i> p.p. (l)	Oleac.
<i>Claoxylon</i>	Euph.	<i>Koilocarpus</i> (p)	Euph.
<i>Clerodendrum</i> p.p.	Verb.	<i>Labiatae</i> p.p.	Lab.
<i>Combretocarpus</i>	Rhiz.	<i>Lagenaria</i> (p)	Cuc.
<i>Crateva</i> (p)	Capp.	<i>Leuconotis</i> (l)	Apoc.
<i>Croton</i>	Euph.	<i>Ligustrum</i> p.p. (l)	Oleac.
<i>Crudia</i> p.p.	Leg.	<i>Limnophila</i> (l)	Scroph.
<i>Deplanchea</i> (p)	Bign.	<i>Lonicera</i> (l)	Caprif.
<i>Desmos chinensis</i> (p)	Annon.	<i>Lophopetalum</i> p.p. (l)	Celastr.
<i>Dichapetalum</i> (l)	Dichap.	<i>Luffa</i> (l)	Cuc.
<i>Diospyros</i> (l)	Eben.	<i>Macaranga</i> p.p.	Euph.
<i>Diplycosia</i> (l)	Eric.	<i>Macrolenes</i> (l)	Melast.
<i>Dunbaria rubella</i> (l)	Leg.	<i>Mallotus</i> p.p.	Euph.
<i>Dysoxylum</i> p.p. (l)	Meliac.	<i>Maranthes</i> (p)	Chrys.



(31. Glands on petiole or lamina, continued)

Taxon	Family	Taxon	Family
<i>Mastixia</i> (l)	Corn.	<i>Rhizophora</i> (l)	Rhiz.
<i>Melanolepis</i>	Euph.	<i>Rhynchosia</i> (l)	Leg.
<i>Momordica</i> p.p.	Cuc.	<i>Rhyssopteris</i> (p)	Malp.
<i>Moringa</i> * (l)	Moring.	<i>Sapium</i> (p)	Euph.
<i>Myxopyrum</i> (l)	Oleac.	<i>Sarcosperma</i> p.p. (p)	Sarcosp.
<i>Neodriessenia</i> (l)	Melast.	<i>Scolopia</i> (p)	Flac.
<i>Neoscortechinia</i> (p)	Euph.	<i>Soulamea</i>	Simar.
<i>Neosepicaea</i> (l)	Bign.	<i>Stemonurus monticolus</i>	Icac.
<i>Nyctocalos</i> (l)	Bign.	<i>Stereospermum</i> (l)	Bign.
<i>Ochanostachys</i> p.p. (l)	Olacac.	<i>Stictocardia</i> (l)	Conv.
<i>Octospermum</i> (l)	Euph.	<i>Tecomanthé</i> (l)	Bign.
<i>Pandorea</i> (l)	Bign.	<i>Terminalia</i> p.p.	Combr.
<i>Parastemon</i> (p)	Chrys.	<i>Teijsmanniodendron</i> (l)	Verb.
<i>Parinari</i> (p)	Chrys.	<i>Timonius</i> p.p. (l)	Rub.
<i>Paropsia</i>	Passifl.	<i>Trewia</i> (l)	Euph.
<i>Passiflora</i> (p)	Passifl.	<i>Trichadenia</i>	Flac.
<i>Perrottetia</i> (l)	Celastr.	<i>Trigoniastrum</i> (l)	Trigon.
<i>Pimelodendron</i> (p)	Euph.	<i>Trigonostemon</i> (p)	Euph.
<i>Piper</i> p.p. (l)	Piper.	<i>Tristellateia</i> (p)	Malp.
<i>Piriqueta</i> *	Turn.	<i>Turnera</i> * (p)	Turn.
<i>Polygonum</i> p.p. (l)	Polygon.	<i>Vaccinium</i> (l)	Eric.
<i>Polyosma</i> (l)	Sax.	<i>Vatica</i> (l)	Dipt.
<i>Pometia</i> p.p. (l)	Sapind.	<i>Walsura</i> p.p. (l)	Meliac.
<i>Prunus</i> (l)	Rosac.	<i>Wetria</i> (l)	Euph.
<i>Psoralea</i> (l)	Leg.	<i>Xanthophyllum</i> (l)	Polygal.
<i>Pullea</i>	Cun.	<i>Xerospermum</i> (l)	Sapind.
<i>Quassia indica</i> (l)	Simar.	<i>Xylosma</i> (p)	Flac.
<i>Radermachera</i> (l)	Bign.		

←

Figure 18. Glands on petiole or lamina – a. *Hollrungia aurantioides*; b. *Quassia indica*; c. *Gaultheria abbreviata*; d. *Ailanthus triphysa*; e. *Maranthes corymbosa*; f. *Ailanthus integrifolia*.



Figure 19. Stipules – a. Intrapetiolar, *Neonauclea wenzelii* (Rub.); b. clasping, *Elmerrillia tsiampacca*; c & d. pectinate, *Canarium kaniense* and *Viola pilosa*.

STIPULES (characters 32–37)

32. Intrapetiolar stipules — Fig. 19a

Plants with opposite leaves and intrapetiolar fused stipules, such as found in *Rubiaceae* and *Rhizophoraceae*. The raised ridges in some *Melastomataceae* and *Apocynaceae* are also considered intrapetiolar stipules (r).

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aizoaceae</i>	Aizoac.	<i>Gynotroches</i>	Rhiz.
<i>Bruguiera</i>	Rhiz.	<i>Jasminum</i> p.p.	Oleac.
<i>Caesalpinia oppositifolia</i>	Leg.	<i>Kandelia</i>	Rhiz.
<i>Callicarpa</i> (r)	Verb.	<i>Lamechites</i> (r)	Apoc.
<i>Carallia</i>	Rhiz.	<i>Mandevilla</i> * (r)	Apoc.
<i>Ceriops</i>	Rhiz.	<i>Medinilla</i> p.p.	Melast.
<i>Chloranthaceae</i> (r)	Chlor.	<i>Micrechites</i> I (r)	Apoc.
<i>Cunoniaceae</i>	Cun.	<i>Moultonianthus</i>	Euph.
<i>Cynanchum</i> p.p.	Asclep.	<i>Neuburgia</i>	Logan.
<i>Dalenia</i> (r)	Melast.	<i>Pellacalyx</i>	Rhiz.
<i>Diplectria</i> (r)	Melast.	<i>Rhizophora</i>	Rhiz.
<i>Dissochaeta</i> (r)	Melast.	<i>Rubiaceae</i> p.p.	Rub.
<i>Elatine</i>	Elat.	<i>Syndiophyllum</i>	Euph.
<i>Erismanthus</i>	Euph.	<i>Tabernaemontana</i> (r)	Apoc.
<i>Fagraea</i>	Logan.	<i>Turpinia</i>	Staph.
<i>Ficus</i> p.p.	Morac.		

33. Stipules clasping — Fig. 19b

Plants with spiral or alternate leaves with broadly attached stipules, leaving an annular scar, such as found in many *Moraceae* and *Magnoliaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aegialitis</i>	Plumb.	<i>Magnolia</i>	Magn.
<i>Agrostistachys longifolia</i>	Euph.	<i>Mainaya</i>	Hamam.
<i>Agrostistachys indica</i>	Euph.	<i>Manglietia</i>	Magn.
<i>Araliaceae</i> p.p.	Aral.	<i>Michelia</i>	Magn.
<i>Artocarpus</i>	Morac.	<i>Ochna</i>	Ochn.
<i>Dillenia</i> p.p.	Dill.	<i>Pachylarnax</i>	Magn.
<i>Dipterocarpus</i>	Dipt.	<i>Parashorea</i> p.p.	Dipt.
<i>Elmerillia</i>	Magn.	<i>Parinari</i> p.p.	Chrys.
<i>Erythroxylon</i>	Erythr.	<i>Piper</i>	Piper.
<i>Ficus</i> p.p.	Morac.	<i>Polygonaceae</i>	Polygon.
<i>Gironniera</i>	Ulm.	<i>Pothomorphe</i> *	Piper.
<i>Gomphia</i>	Ochn.	<i>Sapotaceae</i> p.p.	Sapot.
<i>Houttuynia</i> *	Saur.	<i>Shorea</i> p.p.	Dipt.
<i>Irvingia</i>	Simar.	<i>Symingtonia</i>	Hamam.
<i>Leea</i>	Leeac.	<i>Tadehagi</i>	Leg.
<i>Macaranga</i> p.p.	Euph.	<i>Zippelia</i>	Piper.

34. Stipules pectinate — Fig. 19c, d

Plants in which the stipules are dissected as in some *Ochnaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acranthera</i>	Rub.	<i>Koilodepas longifolia</i>	Euph.
<i>Canarium</i> p.p.	Burs.	<i>Koilodepas pectinata</i>	Euph.
<i>Drypetes eriocarpa</i>	Euph.	<i>Microcos fibrocarpa</i>	Tiliac.
<i>Elaeocarpus</i> p.p.	Elaeoc.	<i>Neckia</i>	Ochn.
<i>Embolanthera</i>	Hamam.	<i>Prunus phaeosticta</i>	Rosac.
<i>Hedyotis</i> p.p.	Rub.	<i>Rubus</i> p.p.	Rosac.
<i>Hugonia</i>	Linac.	<i>Saprosma</i> p.p.	Rub.
<i>Indovethia</i>	Ochn.	<i>Schuurmansia</i>	Ochn.
<i>Jackiopsis</i>	Rub.	<i>Viola pilosa</i>	Viol.

35. Stipules peltate — Fig. 20a, b

Plants in which the stipules are attached in the middle. A well-known example is *Nothofagus*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aeschynomene</i>	Leg.	<i>Eleutherostylis</i>	Tiliac.
<i>Andrachne</i>	Euph.	<i>Nothofagus</i>	Fagac.
<i>Aporosa</i> p.p.	Euph.	<i>Phyllanthus</i> p.p.	Euph.
<i>Cassia javanica</i>	Leg.	<i>Prunus</i> p.p.	Rosac.

36. Stipules striate — Fig. 20c

Plants in which the stipules are provided with longitudinal lines or ridges. A good example is *Rinorea*

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Agrostistachys</i> p.p.	Euph.	<i>Hopea</i> p.p.	Dipt.
<i>Bhesa</i>	Celastr.	<i>Irvingia</i>	Simar.
<i>Centrosema</i> p.p.	Leg.	<i>Mallotus</i> p.p.	Euph.
<i>Cleistanthus</i> p.p.	Euph.	<i>Prismatomeris</i> p.p.	Rub.
<i>Drypetes perreticulata</i> (As)	Euph.	<i>Rinorea</i> p.p.	Viol.
<i>Ficus</i> p.p.	Morac.	<i>Shorea</i> p.p.	Dipt.
<i>Gardeniopsis</i>	Rub.	<i>Spatholobus</i> p.p.	Leg.
<i>Heritiera</i> p.p.	Sterc.		

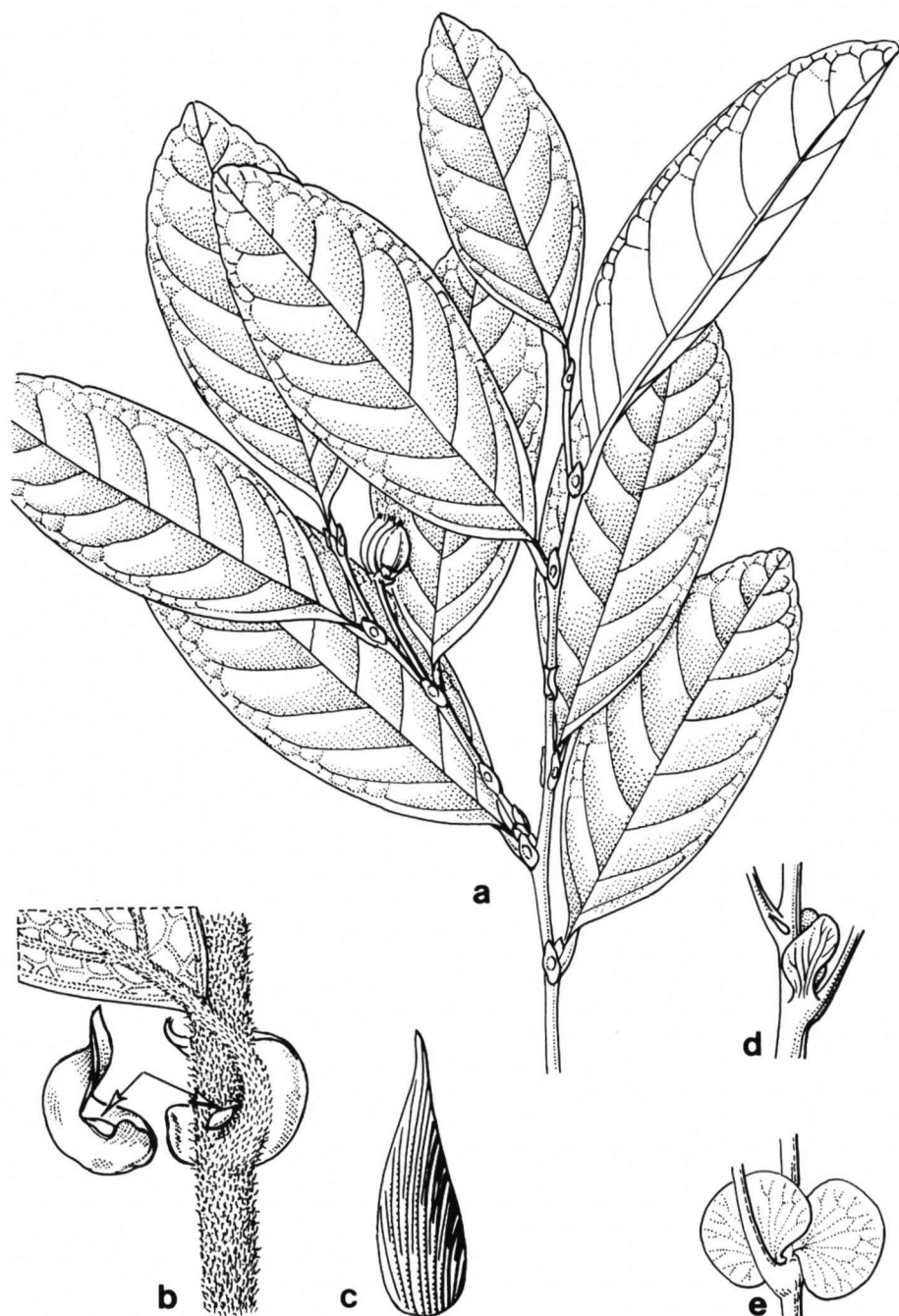


Figure 20. Stipules — peltate: a. *Nothofagus nuda*; b. *Aporosa lagenocarpa*; striate: c. *Rinorea horneri*; foliaceous: d. *Canarium vulgare*; e. *Weinmannia blumei*.

37. *Stipules foliaceus* — Fig. 20d, e (see also Fig. 32, p. 74)

Plants with conspicuously large stipules (c. 1 cm or more across), as in many species of *Macaranga*, *Dipterocarpus*, etc.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Agrimonia</i>	Rosac.	<i>Hibiscus</i>	Malv.
<i>Antidesma</i> p.p.	Euph.	<i>Lepisanthes</i> p.p.	Sapind.
<i>Aporosa</i> p.p.	Euph.	<i>Macaranga</i> p.p.	Euph.
<i>Artocarpus</i>	Morac.	<i>Magnoliaceae</i> p.p.	Magn.
<i>Baccaurea macrophylla</i> p.p.	Euph.	<i>Moultonianthus</i>	Euph.
<i>Caesalpinia</i> p.p.	Leg.	<i>Neillia</i>	Rosac.
<i>Canarium</i> p.p.	Burs.	<i>Osmelia grandistipula</i>	Flac.
<i>Casearia amplexans</i>	Flac.	<i>Picrasma</i>	Simar.
<i>Casearia auriculata</i>	Flac.	<i>Polygonum</i> p.p.	Polygon.
<i>Colona</i>	Tiliac.	<i>Pometia</i> p.p.	Sapind.
<i>Desmodium</i> p.p.	Leg.	<i>Pseudarthria</i>	Leg.
<i>Dipterocarpus</i>	Dipt.	<i>Rubia</i>	Rub.
<i>Elaeocarpus</i> p.p.	Elaeoc.	<i>Shorea</i> p.p.	Dipt.
<i>Ficus</i>	Morac.	<i>Sloanea</i>	Elaeoc.
<i>Galium</i>	Rub.	<i>Turpinia stipulacea</i>	Staph.
<i>Gillbeea</i>	Cun.	<i>Weinmannia</i>	Cun.

PETIOLE / RACHIS (charactes 38–43)

38. Petiole swollen apically — Fig. 21

Plants in which the petiole is swollen at the top and very often also at the base in which case the petiole is bipulvinate as in many *Euphorbiaceae* and *Sterculiaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acer</i> p.p.	Acer.	<i>Croton</i>	<i>Euph.</i>
<i>Acronychia</i> p.p.	Rut.	<i>Dapania</i>	Oxal.
<i>Aglaia</i> p.p.	Meliac.	<i>Deplanchea</i>	Bign.
<i>Alangium</i> p.p.	Alang.	<i>Desmodium</i> p.p.	Leg.
<i>Albertisia</i>	Menisp.	<i>Dimorphocalyx</i> p.p.	Euph.
<i>Alchornea</i>	Euph.	<i>Dipterocarpus</i>	Dipt.
<i>Aleurites</i>	Euph.	<i>Donax</i>	Marant.
<i>Anamirta</i>	Menisp.	<i>Durio</i>	Bomb.
<i>Anisoptera</i>	Dipt.	<i>Elaeocarpus</i> p.p.	Elaeoc.
<i>Antidesma</i> p.p.	Euph.	<i>Elateriospermum</i>	Euph.
<i>Aphanamixis</i> p.p.	Meliac.	<i>Eleutherandra</i>	Flac.
<i>Aporosa</i> p.p.	Euph.	<i>Ellipanthus</i>	Connar.
<i>Araceae</i> p.p.	Arac.	<i>Endospermum</i>	Euph.
<i>Arcangelisia</i>	Menisp.	<i>Evodia</i> p.p.	Rut.
<i>Ashtonia</i> p.p.	Euph.	<i>Evodiella</i> p.p.	Rut.
<i>Atalantia</i> p.p.	Rut.	<i>Fahrenheitia</i>	Euph.
<i>Baccaurea</i> p.p.	Euph.	<i>Fibraurea</i>	Menisp.
<i>Baileoxylon</i> (Au)	Flac.	<i>Ficus</i> p.p.	Morac.
<i>Baloghia</i> (Au P)	Euph.	<i>Firmiana</i>	Sterc.
<i>Bauhinia</i> p.p.	Leg.	<i>Flindersia</i>	Rut.
<i>Berrya</i>	Tiliac.	<i>Fontainea</i> p.p.	Euph.
<i>Bhesa</i>	Celastr.	<i>Geijera</i>	Rut.
<i>Bixa</i> *	Bixac.	<i>Grewia</i> p.p.	Tiliac.
<i>Blumeodendron</i>	Euph.	<i>Halopegia</i>	Marant.
<i>Botryophora</i>	Euph.	<i>Heritiera</i> p.p.	Sterc.
<i>Brachychiton</i>	Sterc.	<i>Hernandia</i> p.p.	Hern.
<i>Brownlowia</i>	Tiliac.	<i>Heterosmilax</i>	Liliac.
<i>Byttneria</i>	Sterc.	<i>Hibiscus</i> p.p.	Malv.
<i>Campostemon</i>	Bomb.	<i>Homalanthus</i> p.p.	Euph.
<i>Carronia</i>	Menisp.	<i>Hydnocarpus</i> p.p.	Flac.
<i>Cephalomappa</i>	Euph.	<i>Hylandia</i> (Au)	Euph.
<i>Ceratopetalum</i>	Cun.	<i>Hymenocardia</i>	Euph.
<i>Chlaenandra</i>	Menisp.	<i>Hypserpa</i> p.p.	Menisp.
<i>Citrus</i> p.p.	Rut.	<i>Jasminum</i> p.p.	Oleac.
<i>Claoxylon</i> p.p.	Euph.	<i>Lasiobema</i>	Leg.
<i>Cleidion</i>	Euph.	<i>Legnephora</i>	Menisp.
<i>Clerodendrum schmidtii</i> (As)	Verb.	<i>Limacia</i> p.p.	Menisp.
<i>Codiaeum</i> p.p.	Euph.	<i>Macaranga</i> p.p.	Euph.
<i>Colona</i>	Tiliac.	<i>Maclurodendron</i>	Rut.
<i>Cominsia</i>	Marant.	<i>Macrocculus</i>	Menisp.
<i>Coscinium</i>	Menisp.	<i>Mallotus</i> p.p.	Euph.

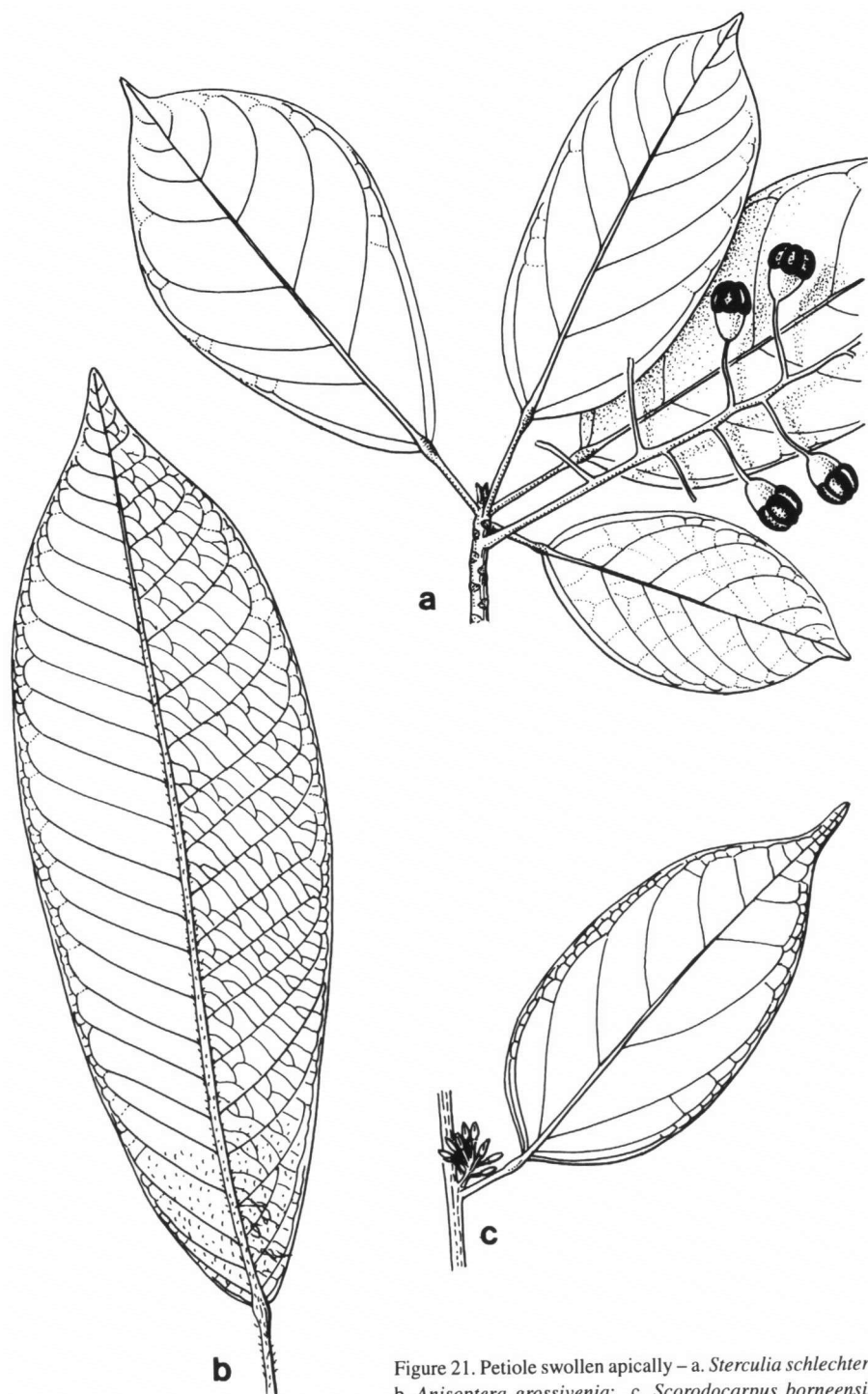


Figure 21. Petiole swollen apically – a. *Sterculia schlechteri*; b. *Anisoptera grossivenia*; c. *Scorodocarpus borneensis*.

(38. Petiole swollen apically, continued)

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Mangifera</i> p.p.	Anac.	<i>Rockinghamia</i> (Au)	Euph.
<i>Maranta</i> *	Marant.	<i>Ryparosa</i>	Flac.
<i>Maxwellia</i> (P)	Sterc.	<i>Sarcopetalum</i>	Menisp.
<i>Melanolepis</i>	Euph.	<i>Sarcotheca</i> p.p.	Oxal.
<i>Melicope</i> p.p.	Rut.	<i>Scaphium</i>	Sterc.
<i>Microcitrus</i>	Rut.	<i>Schumannianthus</i>	Marant.
<i>Millettia unifoliolata</i>	Leg.	<i>Scorodocarpus</i>	Olac.
<i>Monophrynium</i>	Marant.	<i>Shorea</i> p.p.	Dipt.
<i>Neesia</i>	Bomb.	<i>Sida</i> p.p.	Malv.
<i>Neoscortechinia</i>	Euph.	<i>Sloanea</i>	Elaeoc.
<i>Omphalea</i>	Euph.	<i>Spathiostemon</i>	Euph.
<i>Osmelia</i>	Flac.	<i>Stachyphrynium</i>	Marant.
<i>Osmoxylon</i>	Aral.	<i>Stephania</i>	Menisp.
<i>Pachygone</i>	Menisp.	<i>Sterculia</i>	Sterc.
<i>Pangium</i>	Flac.	<i>Stixis</i>	Capp.
<i>Paramignya</i>	Rut.	<i>Streblus</i> p.p.	Morac.
<i>Pentace</i>	Tiliac.	<i>Teijsmanniodendron</i> p.p.	Verb.
<i>Pericampylus</i>	Menisp.	<i>Tetractomia</i> p.p.	Rut.
<i>Phacelophrynium</i>	Marant.	<i>Theobroma</i> *	Sterc.
<i>Phanera</i>	Leg.	<i>Thespesia</i>	Malv.
<i>Phrynium</i>	Marant.	<i>Thunbergia laurifolia</i>	Acanth.
<i>Piliostigma</i>	Leg.	<i>Tinomiscium</i>	Menisp.
<i>Pimelodendron</i>	Euph.	<i>Trichadenia</i>	Flac.
<i>Ptychopyxis</i>	Euph.	<i>Trichospermum</i>	Tiliac.
<i>Pycnarrhena</i>	Menisp.	<i>Upuna</i>	Dipt.
<i>Reevesia</i>	Sterc.	<i>Vitex</i> p.p.	Verb.
<i>Rhodoleia</i> p.p.	Hamam.	<i>Walsura monophylla</i>	Meliac.
<i>Rhynchocarpa</i>	Leg.	<i>Zanthoxylum</i> p.p.	Rut.

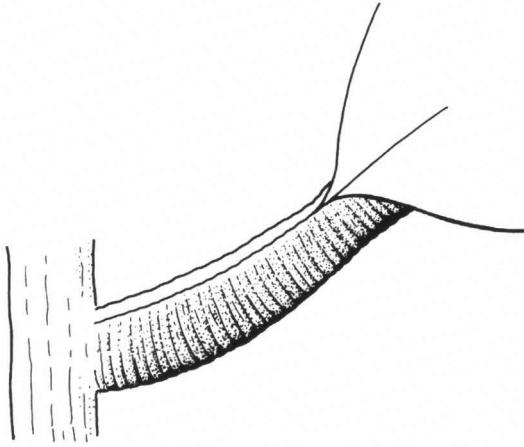


Figure 22. Petiole wrinkled – *Gonocaryum calleryanum*.

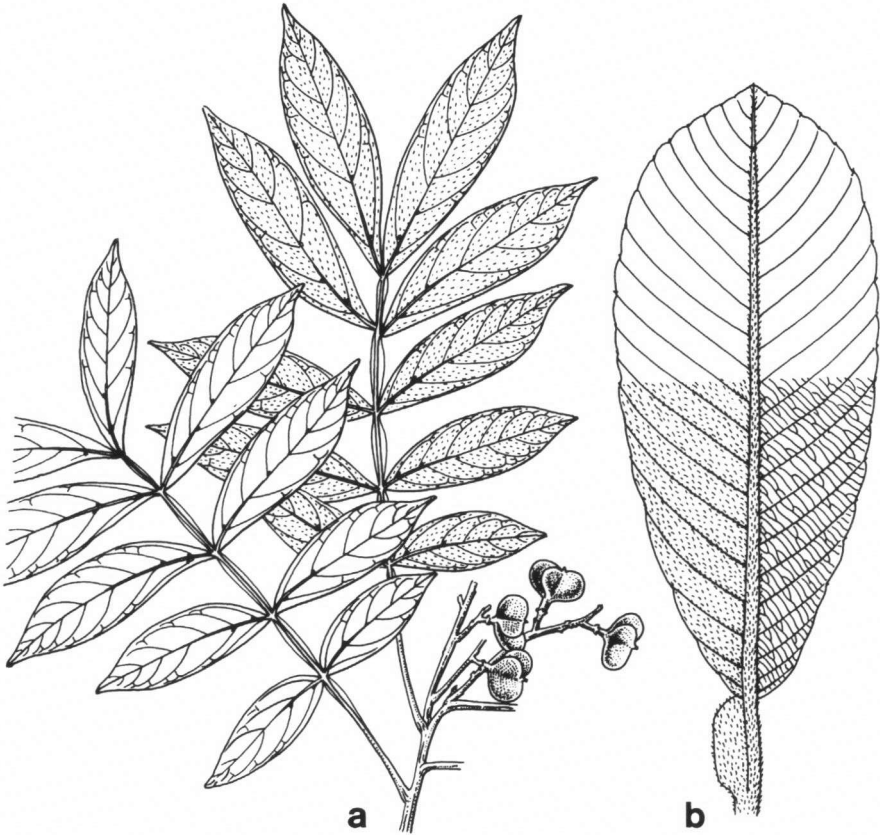


Figure 23. Winged rachis or petiole – a. *Guioa pterorhachis*; b. *Dillenia albiflos*.

39. Petiole wrinkled — Fig. 22

Petiole showing transverse ridges, very distinct in *Gonocaryum*.

Taxon	Family	Taxon	Family
<i>Cleistanthus</i> p.p.	Euph.	<i>Microtropis kinabaluensis</i>	Celastr.
<i>Diospyros</i> p.p.	Eben.	<i>Platea</i> p.p.	Icac.
<i>Drypetes</i> p.p.	Euph.	<i>Platymitra</i>	Annon.
<i>Garcinia</i> p.p.	Gutt.	<i>Salacia</i> p.p.	Celastr.
<i>Gonocaryum</i>	Icacin.	<i>Shorea</i> p.p.	Dipt.
<i>Ilex</i> p.p.	Aquif.	<i>Syzygium</i> p.p.	Myrt.
<i>Incarpus</i>	Leg.	<i>Uvaria</i> p.p.	Annon.
<i>Mammea calciphylla</i>	Gutt.	<i>Xanthophyllum</i> p.p.	Polygal.
<i>Mammea woodii</i> p.p.	Gutt.		

40. Winged rachis / petiole — Fig. 23

Plants with compound leaves of which the rachis is provided with flat ridges or wings as in *Guioa* or simple leaves of which the petiole is winged as in many species of *Dillenia*.

Taxon	Family	Taxon	Family
<i>Acrotrema</i>	Dill.	<i>Inga edulis</i> *	Leg.
<i>Alloxylon (Oreocallis)</i>	Prot.	<i>Leea</i>	Leeac.
<i>Archidendron pteropum</i>	Leg.	<i>Lepisanthes</i> p.p.	Sapind.
<i>Burkillanthus</i>	Rut.	<i>Limonia</i>	Rut.
<i>Campnosperma</i> p.p.	Anac.	<i>Melicope</i> p.p.	Rut.
<i>Citrus</i> p.p.	Rut.	<i>Merrillia</i>	Rut.
<i>Crescentia alata</i> *	Bign.	<i>Peronema canescens</i>	Verb.
<i>Davidsonia</i> (Au)	Dauids.	<i>Pistacia</i>	Anac.
<i>Dictyonera</i>	Sapind.	<i>Pleiospermium</i> p.p.	Rut.
<i>Dillenia</i> p.p.	Dill.	<i>Quassia</i> p.p.	Simar.
<i>Dysoxylum</i> p.p.	Meliac.	<i>Sapindus</i>	Sapind.
<i>Evodia</i> p.p.	Rut.	<i>Tadehagi</i>	Leg.
<i>Fagara</i> *	Rut.	<i>Tecomanthe</i> p.p.	Bign.
<i>Felicium</i> *	Sapind.	<i>Teijsmanniodendron</i> p.p.	Verb.
<i>Feronia elephantum</i>	Rut.	<i>Toddalia</i> p.p.	Rut.
<i>Grevillea</i> p.p.	Prot.	<i>Turrillia</i>	Prot.
<i>Guioa</i> p.p.	Sapind.	<i>Vitex limonifolia</i>	Verb.
<i>Harpullia</i>	Sapind.	<i>Weinmannia</i> p.p.	Cun.
<i>Harrisonia perforata</i>	Simar.	<i>Zanthoxylum</i> p.p.	Rut.
<i>Hesperethusa</i>	Rut.		

41. Free rachis tip — Fig. 24

Compound leaves in which the rachis has a free ending, a common feature in most *Sapindaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Archidendron</i> p.p.	Leg.	<i>Engelhardia</i> p.p.	Jugl.
<i>Astragalus</i> *	Leg.	<i>Euroschinus</i> p.p.	Anac.
<i>Biophytum</i> p.p.	Oxal.	<i>Parkinsonia</i> *	Leg.
<i>Chisocheton</i> p.p.	Meliac.	<i>Pistacia</i> p.p.	Anac.
<i>Chukrasia</i> p.p.	Meliac.	<i>Rutaceae</i> p.p.	Rut.
<i>Dysoxylum</i> p.p.	Meliac.	<i>Sapindaceae</i> p.p.	Sapind.

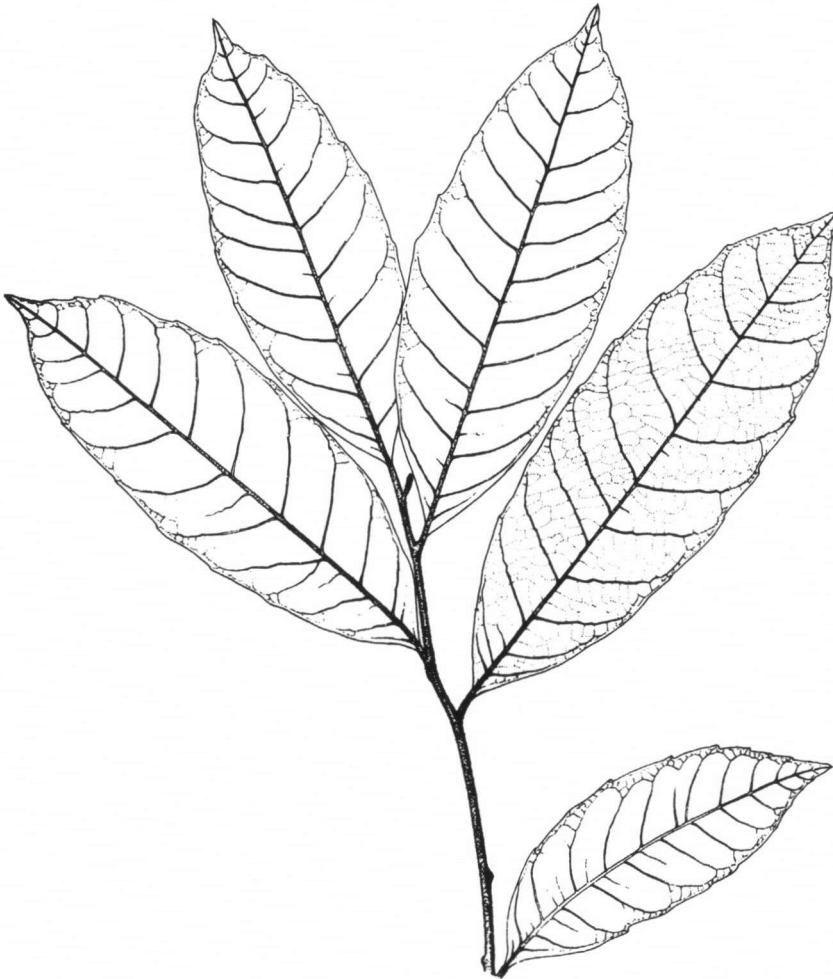


Figure 24. Free rachis tip – *Cupaniopsis stenopetala* (Sapind.).

42. Rachis with swollen nodes — Fig. 25

Compound leaves of which the rachis is swollen at the nodes. In some species, e.g. in *Oroxylum*, the rachis may break up at these nodes.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aralia</i>	Aral.	<i>Meliosma</i> p.p.	Sab.
<i>Archidendron</i>	Leg.	<i>Moringa</i> *	Moring.
<i>Arthrophyllum</i>	Aral.	<i>Oroxylum</i>	Bign.
<i>Canarium</i> p.p.	Burs.	<i>Picrasma</i>	Simar.
<i>Dacryodes</i>	Burs.	<i>Polyscias</i>	Aral.
<i>Eurycoma</i>	Simar.	<i>Radermachera</i>	Bign.
<i>Gastonia</i>	Aral.	<i>Walsura</i> p.p.	Meliac.
<i>Heynea</i>	Meliac.		
<i>Lamiodendron</i>	Bign.		
<i>Leea</i>	Leeac.		

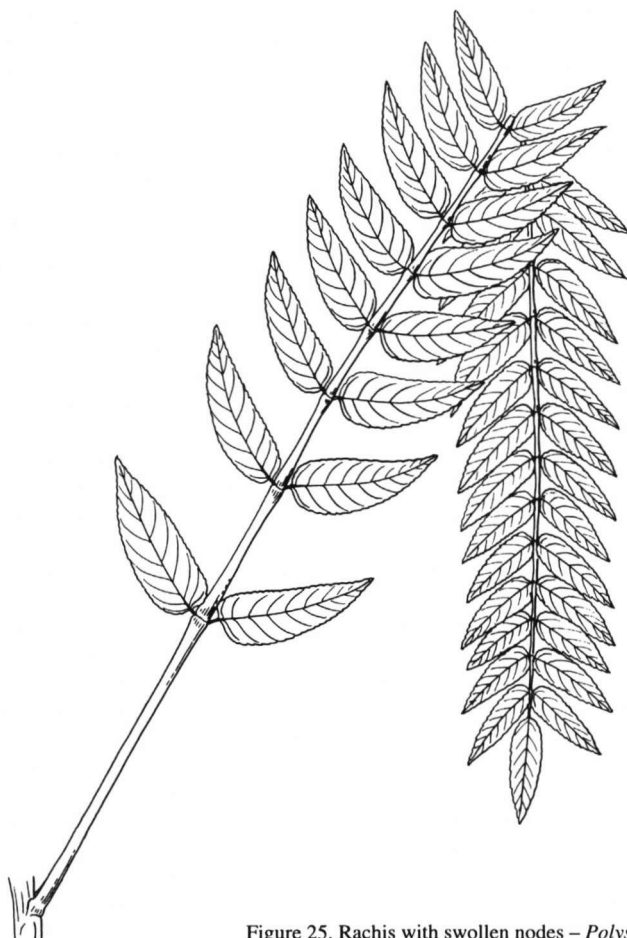


Figure 25. Rachis with swollen nodes — *Polyscias nodosa*.

43. Petiole strongly swollen at base — Fig. 26

Plants in which the base of the petiole is conspicuously thicker than the rest of the petiole, exemplified by *Proteaceae* and *Mangifera*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Alloxylon</i>	Prot.	<i>Magnolia</i> p.p.	Magn.
<i>Barringtonia</i>	Lecyth.	<i>Mangifera</i> p.p.	Anac.
<i>Helicia</i> p.p.	Prot.	<i>Michelia</i> p.p.	Magn.
<i>Heliciopsis</i>	Prot.	<i>Semecarpus</i> p.p.	Anac.
<i>Lithocarpus</i> p.p.	Fagac.	<i>Swintonia</i>	Anac.
<i>Macadamia</i>	Prot.		



Figure 26. Petiole strongly swollen at base – a. *Macadamia hildebrandii*; b. *Barringtonia macrostachys*.

LAMINA (characters 44–69)

44. Leaves spiral in opposite-leaved families — Fig. 27

In most families the leaves are either opposite or spiral, but in some there are a few exceptions, e.g. in most *Apocynaceae* the leaves are opposite or verticillate, a few genera have spiral leaves, e.g. *Cerbera*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Catanthera</i>	Melast.	<i>Lepinia</i>	Apoc.
<i>Cerbera</i>	Apoc.	<i>Lepiniopsis</i>	Apoc.
<i>Crescentia</i> *	Bign.	<i>Medinilla</i> p.p.	Melast.
<i>Dendrophthoe</i>	Loranth.	<i>Melastoma</i> p.p.	Melast.
<i>Gesneriaceae</i> p.p.	Gesn.	<i>Plumeria</i> *	Apoc.
<i>Hederella</i>	Melast.	<i>Sonerila</i>	Melast.
<i>Helixanthera</i>	Loranth.	<i>Tristaniopsis</i>	Myrt.
<i>Jasminum</i> p.p.	Oleac.	<i>Xanthostemon</i>	Myrt.
<i>Kjellbergiodendron</i>	Myrt.		



Figure 27. Leaves spiral in opposite-leaved families – *Cerbera odollam*.

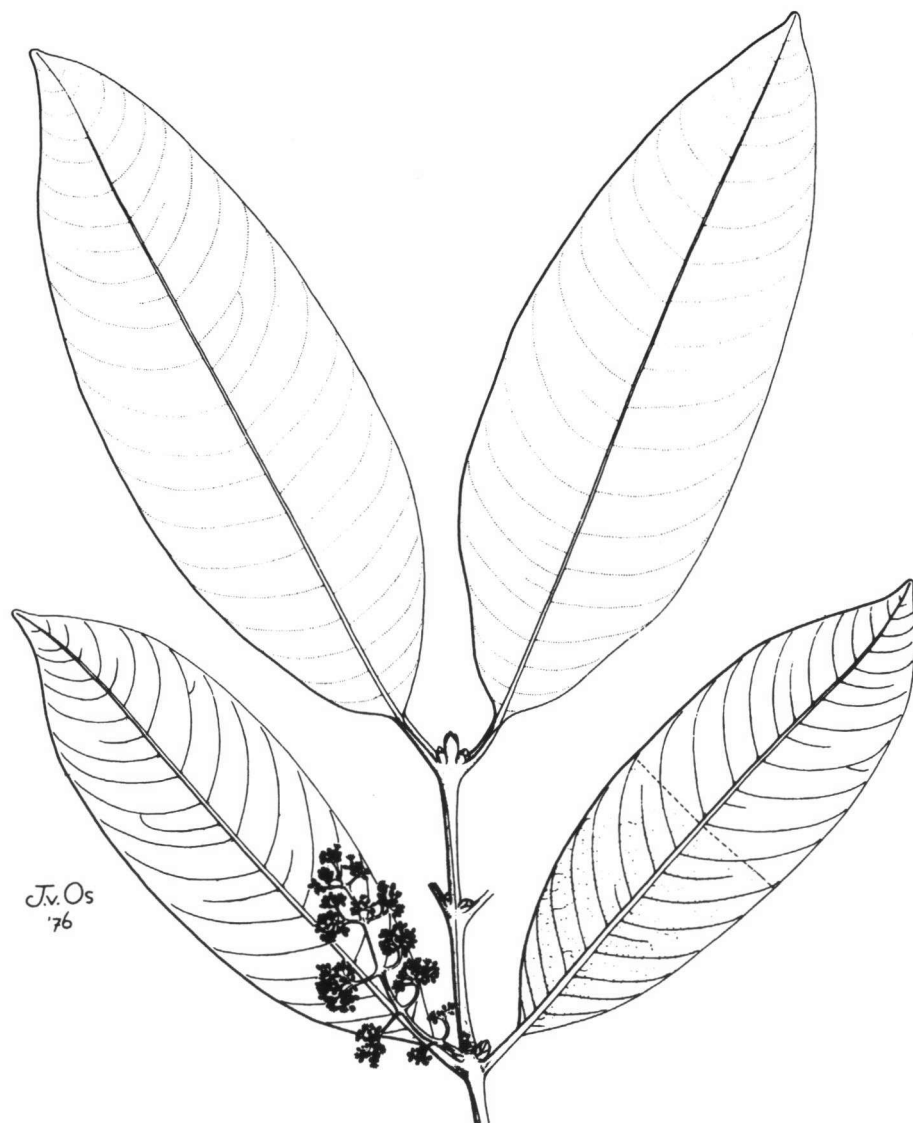


Figure 28. Leaves opposite in spiral-leaved families – *Bouea macrophylla*.

45. Leaves opposite in spiral-leaved families — Fig. 28

In most *Icacinaeae* the leaves are spiral but a few genera have opposite leaves, e. g. *Iodes*. *Bouea* is the only genus of the *Anacardiaceae* with opposite leaves.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aceratium</i>	Elaeoc.	<i>Iodes</i>	Icacin.
<i>Adriana</i> (Au)	Euph.	<i>Litsea</i> p.p.	Laur.
<i>Austrobuxus</i>	Euph.	<i>Mallotus</i> p.p.	Euph.
<i>Begonia</i> p.p.	Begon.	<i>Moultonianthus</i>	Euph.
<i>Beilschmiedia</i> p.p.	Laur.	<i>Neotrewia</i>	Euph.
<i>Borneodendron</i>	Euph.	<i>Passiflora cochinchinensis</i>	Passifl.
<i>Bouea</i>	Anac.	<i>Platylobium</i> (Au)	Leg.
<i>Brachysema</i> (Au)	Leg.	<i>Polyporandra</i>	Icacin.
<i>Caesalpinia</i> p.p.	Leg.	<i>Ryparosa</i> p.p.	Flac.
<i>Choriceras</i>	Euph.	<i>Sapotaceae</i> p.p.	Sapot.
<i>Cinnamomum</i> p.p.	Laur.	<i>Saurauia</i> p.p.	Actin.
<i>Citronella</i> p.p.	Icacin.	<i>Scaevola</i> p.p.	Good.
<i>Dysoxylum</i> p.p.	Meliac.	<i>Sericolea</i>	Elaeoc.
<i>Endiandra</i> p.p.	Laur.	<i>Symplocos</i> p.p.	Sympl.
<i>Erismanthus</i>	Euph.	<i>Tournefortia</i> p.p.	Borag.
<i>Excoecaria</i> p.p.	Euph.	<i>Trewia</i>	Euph.
<i>Ilex</i> p.p.	Aquif.		



Figure 29. Leaves verticillate – a. *Macadamia hildebrandii*; b. *Illicium tenuifolium*.

46. Leaves verticillate — Fig. 29

More than two leaves inserted at the same level as, e.g., in *Alstonia*; when the leaves are crowded but not exactly at the same level as, e.g., in *Pittosporum* they are also considered verticillate. In this case the name is followed by (c).

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acsmithia</i> p.p.	Cun.	<i>Epiprinus</i> (c)	Euph.
<i>Actinodaphne</i>	Laur.	<i>Eugenia</i> p.p.	Myrt.
<i>Aeschynanthus</i> p.p.	Gesn.	<i>Euphorbia cotinifolia</i> *	Euph.
<i>Alchornea</i> p.p. (c)	Euph.	<i>Faradaya</i> p.p.	Verb.
<i>Allamanda</i> *	Apoc.	<i>Gaertnera</i> p.p.	Rub.
<i>Alseodaphne</i> p.p.	Laur.	<i>Galium</i>	Rub.
<i>Alseuosmia</i> (P)	Alseu.	<i>Ganua pallida</i> (c)	Sapot.
<i>Alstonia</i>	Apoc.	<i>Garcinia</i> p.p.	Gutt.
<i>Alyxia</i> p.p.	Apoc.	<i>Gardenia</i> p.p.	Rub.
<i>Amylotheca duthieana</i>	Loranth.	<i>Geunsia</i> p.p.	Verb.
<i>Angelonia</i> *	Scroph.	<i>Greenea</i> p.p.	Rub.
<i>Ardisia</i> p.p.	Myrsin.	<i>Guettarda</i> p.p.	Rub.
<i>Argostemma</i> p.p.	Rub.	<i>Gymnostoma</i>	Casuar.
<i>Asclepiadaceae</i> p.p.	Asclep.	<i>Halfordia</i> p.p. (c)	Rut.
<i>Banksia</i> p.p.	Prot.	<i>Haloragis</i> p.p.	Halor.
<i>Blaberopus</i>	Apoc.	<i>Hamelia</i> p.p. *	Rub.
<i>Blepharis</i> p.p.	Acanth.	<i>Hedyotis</i> p.p.	Rub.
<i>Blumeodendron</i> p.p. (c)	Euph.	<i>Helicia</i> (c)	Prot.
<i>Borneodendron</i>	Euph.	<i>Helixanthera</i> p.p. (c)	Loranth.
<i>Brasenia</i> (c)	Nymph.	<i>Hydrilla</i>	Hydroch.
<i>Casuarina</i>	Casuar.	<i>Ilex</i> p.p.	Aquif.
<i>Cephalanthus</i> p.p.	Rub.	<i>Illicium</i> (c)	Illic.
<i>Ceratophyllum</i>	Cerat.	<i>Impatiens</i> p.p.	Bals.
<i>Cerbera</i> (c)	Apoc.	<i>Ixora</i> p.p.	Rub.
<i>Ceuthostoma</i>	Casuar.	<i>Jagera</i> (c)	Sapind.
<i>Chionanthus acuminatus</i>	Oleac.	<i>Kibara</i> p.p.	Monim.
<i>Chloranthus henryi</i> (As)	Chlor.	<i>Lampas</i>	Loranth.
<i>Codiaeum</i> p.p. (c)	Euph.	<i>Lantana</i> p.p. *	Verb.
<i>Coelospermum</i> p.p.	Rub.	<i>Lasiococca</i> (c)	Euph.
<i>Coffea</i> p.p.	Rub.	<i>Limnophila</i> p.p.	Scroph.
<i>Combretum</i> p.p.	Combr.	<i>Macadamia</i>	Prot.
<i>Coprosma</i> p.p.	Rub.	<i>Macaranga</i> p.p.	Euph.
<i>Corynocarpus</i> p.p. (c)	Coryn.	<i>Macrosolen curvinervis</i>	Loranth.
<i>Crispiloba</i> (Au)	Alseu.	<i>Madhuca sessilis</i> (c)	Sapot.
<i>Croton</i> p.p. (c)	Euph.	<i>Malpighiaceae</i> p.p.	Malp.
<i>Daphniphyllum</i> (c)	Daphn.	<i>Mangifera</i> p.p.	Anac.
<i>Deplanchea</i>	Bign.	<i>Medinilla</i> p.p.	Melast.
<i>Discocalyx</i> p.p.	Myrsin.	<i>Melodinus</i> p.p.	Apoc.
<i>Drimys</i> p.p. (c)	Wint.	<i>Mesua</i> p.p.	Gutt.
<i>Dyera</i>	Apoc.	<i>Meyna</i> p.p.	Rub.
<i>Dysophylla</i>	Lab.	<i>Mitrasacme</i>	Logan.
<i>Elatine</i> p.p.	Elat.	<i>Morinda</i> p.p.	Rub.

(46. Leaves verticillate, continued)

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Mussaenda</i> p.p.	Rub.	<i>Scaevola verticillata</i>	Good.
<i>Myriophyllum</i>	Halor.	<i>Schuurmansia</i> (c)	Ochn.
<i>Myxopyrum?</i> p.p.	Oleac.	<i>Scoparia</i> p.p.	Scroph.
<i>Neolitsea</i> (c)	Laur.	<i>Semecarpus</i> p.p. (c)	Anac.
<i>Nerium</i> *	Apoc.	<i>Sericolea</i> p.p.	Elaeoc.
<i>Nothopegiopsis</i>	Anac.	<i>Sopubia</i> p.p.	Scroph.
<i>Ochrosia</i> p.p.	Apoc.	<i>Sphenostemon</i> (c)	Sphen.
<i>Paederia</i> p.p.	Rub.	<i>Spigelia</i>	Logan.
<i>Parsonsia</i> p.p.	Apoc.	<i>Stemodia</i>	Scroph.
<i>Pavetta</i> p.p.	Rub.	<i>Swintonia</i> p.p. (c)	Anac.
<i>Peperomia</i> p.p.	Piper.	<i>Symplocos</i> p.p.	Sympl.
<i>Pimelodendron</i> p.p. (c)	Euph.	<i>Syncarpia</i>	Myrt.
<i>Pisonia</i> p.p. (c)	Nyctag.	<i>Terminalia</i> p.p. (c)	Combr.
<i>Pittosporum</i> p.p.	Pitt.	<i>Ternstroemia</i> (c)	Theac.
<i>Polysma verticillata</i>	Sax.	<i>Trigonobalanus</i>	Fagac.
<i>Premna</i> p.p.	Verb.	<i>Trigonostemon</i> p.p. (c)	Euph.
<i>Psychotria</i> p.p.	Rub.	<i>Tristaniopsis</i> p.p. (c)	Myrt.
<i>Pullea</i> p.p.	Cun.	<i>Trithecanthera</i>	Loranth.
<i>Quercus</i> (c)	Fagac.	<i>Veronica</i> p.p.	Scroph.
<i>Quisqualis</i> p.p.	Combr.	<i>Wendlandia</i> p.p.	Rub.
<i>Rauvolfia</i>	Apoc.	<i>Wetria</i> p.p. (c)	Euph.
<i>Rhododendron</i> p.p. (c)	Eric.	<i>Wittsteinia</i>	Alseu.
<i>Russelia</i> *	Scroph.	<i>Wrightia</i> p.p.	Apoc.
<i>Saprosma</i> p.p.	Rub.	<i>Xanthostemon</i> p.p. (c)	Myrt.

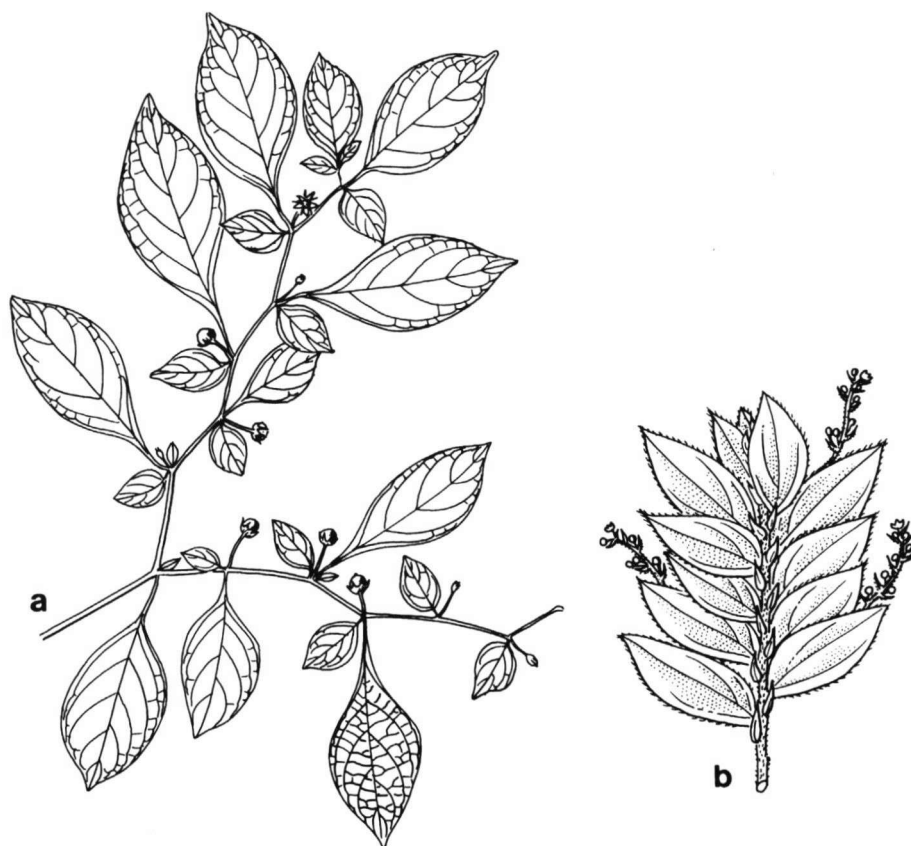
47. Leaves anisophyllous — Fig. 30

The (members of an opposite pair of) leaves unequal in size, as in many *Acanthaceae* and *Rubiaceae* and in *Mallotus miquelianus*. Also placed in this category are some species of *Trigonostemon* with crowded leaves which are of different size.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aeschynanthus</i> p.p.	Gesn.	<i>Clerodendrum</i> p.p.	Verb.
<i>Agalmyla</i>	Gesn.	<i>Cypholophus nummularis</i>	Urt.
<i>Aidia</i> p.p.	Rub.	<i>Cyrtandra</i> p.p.	Gesn.
<i>Aidiopsis</i> p.p.	Rub.	<i>Cyrtandromoea</i>	Scroph.
<i>Alyxia</i> p.p.	Apoc.	<i>Dacrycarpus imbricatus</i>	Podoc.
<i>Anerincleistus</i>	Melast.	<i>Didissandra</i> p.p.	Gesn.
<i>Anisophyllea</i>	Rhiz.	<i>Driessenia</i>	Melast.
<i>Argostemma</i> p.p.	Rub.	<i>Elatostema</i> p.p.	Urt.
<i>Barathranthus</i>	Loranth.	<i>Geunsia</i> p.p.	Verb.
<i>Blastus</i> p.p.	Melast.	<i>Hallieracantha</i>	Acanth.
<i>Boehmeria</i> p.p.	Urt.	<i>Hedyotis</i> p.p.	Rub.
<i>Callicarpa</i> p.p.	Verb.	<i>Hymenodictyon</i>	Rub.

(30. Leaves anisophyllous, continued)

Taxon	Family	Taxon	Family
<i>Kibara</i> p.p.	Monim.	<i>Poikilogyne</i> p.p.	Melast.
<i>Kochummenia</i> p.p.	Rub.	<i>Porterandia</i> p.p.	Rub.
<i>Leucosyke</i> p.p.	Urt.	<i>Ptyssiglottis</i>	Acanth.
<i>Loxonia</i>	Gesn.	<i>Rhynchoglossum</i>	Gesn.
<i>Lycianthes</i> p.p.	Solan.	<i>Rothmannia</i> p.p.	Rub.
<i>Mallotus</i> sect. <i>Hancea</i>	Euph.	<i>Solanum</i> p.p.	Solan.
<i>Maoutia</i> p.p.	Urt.	<i>Sonerila</i>	Melast.
<i>Medinilla</i> p.p.	Melast.	<i>Stauranthera</i>	Acanth.
<i>Microtoena</i>	Lab.	<i>Strobilanthes</i> p.p.	Acanth.
<i>Mussaenda anisophylla</i>	Rub.	<i>Trewia</i> p.p.	Euph.
<i>Neodriessenia</i>	Melast.	<i>Tribulus</i>	Zygoph.
<i>Neotrewia</i>	Euph.	<i>Trigonostemon</i> p.p.	Euph.
<i>Phyllagathis</i>	Melast.		

Figure 30. Leaves anisophyllous – a. *Solanum biflorum*; b. *Anisophyllea disticha*.

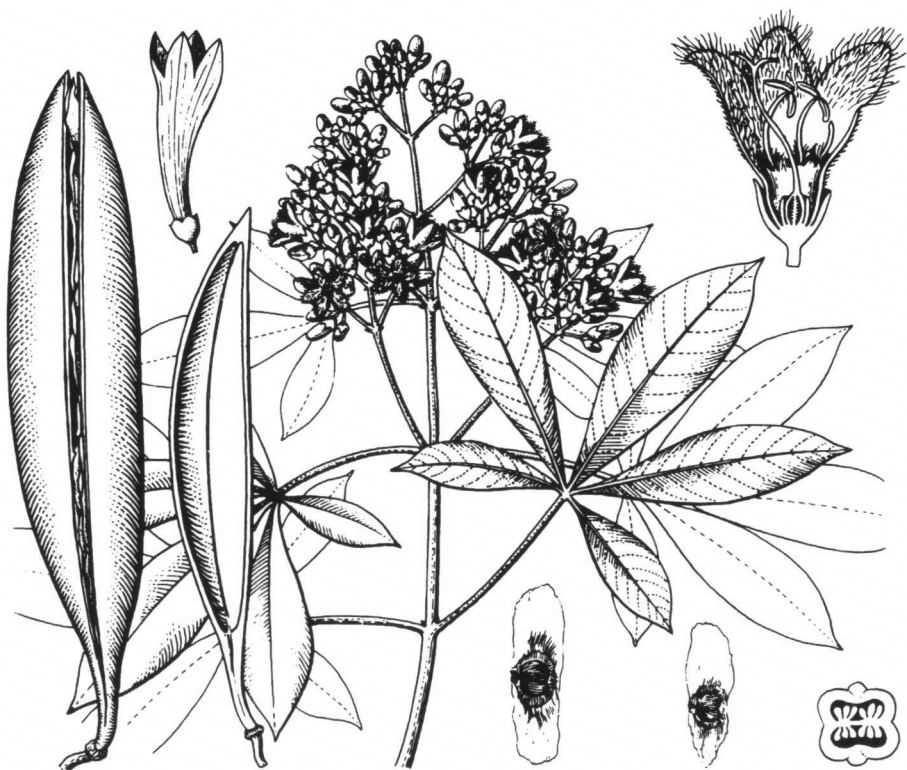


Figure 31. Leaves palmately compound – *Neosepicaea viticoides*.

48. Leaves palmately compound — Fig. 31

Leaves with three or more leaflets at the top of the petiole, e. g. most species of *Schefflera*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acanthopanax</i>	Aral.	<i>Luvunga</i>	Rut.
<i>Acronychia</i> p.p.	Rut.	<i>Mackinlaya</i> p.p.	Aral.
<i>Agelaea</i>	Connar.	<i>Macropanax</i>	Aral.
<i>Allophylus</i> p.p.	Sapind.	<i>Melicope</i> p.p.	Rut.
<i>Annesyoa</i>	Euph.	<i>Merremia</i> p.p.	Conv.
<i>Bischofia</i>	Euph.	<i>Neosepicaea</i> p.p.	Bign.
<i>Bombax</i>	Bomb.	<i>Nyctocalos</i> p.p.	Bign.
<i>Brassaiopsis</i>	Aral.	<i>Osmoxylon</i> p.p.	Aral.
<i>Burkillanthus</i> p.p.	Rut.	<i>Oxalis</i>	Oxal.
<i>Caldcluvia</i> p.p.	Cun.	<i>Protium</i> p.p.	Burs.
<i>Canarium</i> p.p.	Burs.	<i>Rhus</i> p.p.	Anac.
<i>Cannabis</i> *	Cannab.	<i>Rosaceae</i> p.p.	Rosac.
<i>Ceiba</i> *	Bomb.	<i>Sandoricum</i>	Meliac.
<i>Ceratopetalum</i>	Cun.	<i>Santiria</i> p.p.	Burs.
<i>Clematis</i> p.p.	Ranunc.	<i>Sarcotheca</i> p.p.	Oxal.
<i>Cleome</i>	Capp.	<i>Schefflera</i> p.p.	Aral.
<i>Connarus</i> p.p.	Connar.	<i>Sterculia</i> p.p.	Sterc.
<i>Crateva</i>	Capp.	<i>Tecomathe</i> p.p.	Bign.
<i>Crescentia alata</i> *	Bign.	<i>Teijsmanniodendron</i> p.p.	Verb.
<i>Dacryodes</i> p.p.	Burs.	<i>Tetractomia</i>	Rut.
<i>Dioscorea</i> p.p.	Diosc.	<i>Toddalia</i>	Rut.
<i>Evodia</i> p.p.	Rut.	<i>Trevesia</i>	Aral.
<i>Geissois</i> (P)	Cun.	<i>Triphasia</i>	Rut.
<i>Harrisonia</i>	Simar.	<i>Turpinia</i> p.p.	Staph.
<i>Heritiera</i> p.p.	Sterc.	<i>Vitaceae</i> p.p.	Vit.
<i>Hevea</i> *	Euph.	<i>Vitex</i> p.p.	Verb.
<i>Illigera</i>	Hern.	<i>Walsura</i> p.p.	Meliac.
<i>Jasminum</i> p.p.	Oleac.	<i>Weinmannia</i> p.p.	Cun.
<i>Leguminosae</i> p.p.	Leg.	<i>Zanthoxylum ovalifolium</i>	Rut.



Figure 32. Leaves compound opposite – *Gillbeea papuana*.

49. Leaves compound opposite — Fig. 32 (see also Fig. 31, p. 72)

Leaves palmately compound, pinnate or bipinnate and opposite, as, e.g., in many *Cunoniaceae* and *Bignoniaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acronychia</i> p.p.	Rut.	<i>Neosepicaea</i>	Bign.
<i>Aistopetalum</i>	Cun.	<i>Nyctocalos</i>	Bign.
<i>Caesalpinia oppositifolia</i>	Leg.	<i>Oroxylum</i>	Bign.
<i>Caldcluvia</i> p.p.	Cun.	<i>Pajanelia</i>	Bign.
<i>Ceratopetalum</i> p.p.	Cun.	<i>Pandorea</i>	Bign.
<i>Clematis</i> p.p.	Ranunc.	<i>Peronema</i>	Verb.
<i>Compositae</i> p.p.	Comp.	<i>Petraeovitex</i>	Verb.
<i>Davidsonia</i> (Au)	Davids.	<i>Premna</i> p.p.	Verb.
<i>Dolichandrone spathacea</i>	Bign.	<i>Radermachera</i>	Bign.
<i>Dysoxylum</i> p.p.	Meliac.	<i>Salvia scapiformis</i>	Lab.
<i>Evodia</i> p.p.	Rut.	<i>Sambucus</i>	Caprif.
<i>Evodiella</i> p.p.	Rut.	<i>Schrebera</i>	Oleac.
<i>Fernandoa</i>	Bign.	<i>Sesamum</i> *	Pedal.
<i>Flindersia</i> p.p.	Rut.	<i>Stereospermum</i>	Bign.
<i>Fraxinus</i>	Oleac.	<i>Tecoma</i> *	Bign.
<i>Gillbeea</i>	Cun.	<i>Tecomanthe</i>	Bign.
<i>Hieris</i>	Bign.	<i>Teijsmanniodendron</i> p.p.	Verb.
<i>Jasminum</i> p.p.	Oleac.	<i>Tribulus</i>	Zygoph.
<i>Lamiodendron</i>	Bign.	<i>Turpinia</i>	Staph.
<i>Melicope</i> p.p.	Rut.	<i>Valeriana</i>	Val.
<i>Millingtonia</i>	Bign.	<i>Vitex</i> p.p.	Verb.
<i>Naravelia</i>	Ranunc.	<i>Weinmannia</i> p.p.	Cun.



Figure 33. Leaves 2- or 3-pinnate – *Moringa oleifera*.

50. Leaves 2-, 3- (or 4-)pinnate — Fig. 33

Leaves double or triple (or quadruple) pinnate, exemplified by *Melia* and *Moringa*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acacia</i> p.p.	Leg.	<i>Melia</i>	Meliac.
<i>Acrocarpus</i>	Leg.	<i>Millingtonia</i>	Bign.
<i>Adenanthera</i>	Leg.	<i>Mimosa</i> *	Leg.
<i>Albizia</i>	Leg.	<i>Moringa</i> *	Moring.
<i>Ampelopsis</i> p.p.	Vit.	<i>Neptunia</i>	Leg.
<i>Aralia</i>	Aral.	<i>Oroxylum</i>	Bign.
<i>Archidendron</i>	Leg.	<i>Pararchidendron</i>	Leg.
<i>Archidendropsis</i>	Leg.	<i>Paraserianthes</i>	Leg.
<i>Artemisia</i> p.p.	Comp.	<i>Parkia</i>	Leg.
<i>Arthrophyllum</i>	Aral.	<i>Peltophorum</i>	Leg.
<i>Astilbe</i>	Sax.	<i>Pithecellobium</i>	Leg.
<i>Begonia bipinnatifida</i>	Begon.	<i>Polyscias</i> p.p.	Aral.
<i>Bidens</i> p.p.	Comp.	<i>Radermachera</i>	Bign.
<i>Boenninghausenia</i>	Rut.	<i>Salvia</i> p.p.	Lab.
<i>Caesalpinia</i>	Leg.	<i>Samanea</i> *	Leg.
<i>Clematis</i> p.p.	Ranunc.	<i>Schefflera</i> p.p.	Aral.
<i>Cosmos</i> *	Comp.	<i>Schleinitzia</i>	Leg.
<i>Delonix</i> *	Leg.	<i>Serianthes</i>	Leg.
<i>Entada</i>	Leg.	<i>Stenocarpus</i> p.p.	Prot.
<i>Heteropanax</i> *	Aral.	<i>Thalictrum</i>	Ranunc.
<i>Jacaranda</i> *	Bign.	<i>Tristiropsis</i>	Sapind.
<i>Leucaena</i> *	Leg.	<i>Umbelliferae</i> p.p.	Umb.
<i>Lomatia</i> (Au)	Prot.	<i>Wallaceodendron</i>	Leg.

51. Leaves peltate — Fig. 34

Lamina attached away from the base as in *Nymphaea*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Alocasia</i> p.p.	Arac.	<i>Homalomena</i> p.p.	Arac.
<i>Brasenia</i>	Nymph.	<i>Hydrocotyle</i>	Umb.
<i>Brownlowia</i> p.p.	Tiliac.	<i>Hydrostemma</i>	Nymph.
<i>Carica</i> *	Caric.	<i>Macaranga</i> p.p.	Euph.
<i>Cissampelos</i> p.p.	Menisp.	<i>Mallotus</i> p.p.	Euph.
<i>Colocasia</i> p.p.	Arac.	<i>Megistostigma peltatum</i>	Euph.
<i>Coscinium</i>	Menisp.	<i>Merremia peltata</i>	Conv.
<i>Cyclea</i>	Menisp.	<i>Nelumbo</i>	Nymph.
<i>Dendrocnide peltata</i>	Urt.	<i>Nymphaea</i>	Nymph.
<i>Dichondra</i>	Conv.	<i>Nymphoides</i>	Gent.
<i>Diploclisia</i> p.p.	Menisp.	<i>Octomeles</i>	Datisc.
<i>Ellipanthus beccarii</i> var. <i>peltata</i>	Connar.	<i>Pothomorphe peltata</i> *	Piper.
<i>Endospermum</i> p.p.	Euph.	<i>Pterospermum</i> p.p.	Sterc.
<i>Gonatanthus</i> (As)	Arac.	<i>Sarcopetalum</i>	Menisp.
<i>Harmsioplanax</i> p.p.	Aral.	<i>Shorea peltata</i>	Dipt.
<i>Helicia peltata</i>	Prot.	<i>Stephania</i>	Menisp.
<i>Hernandia</i> p.p.	Hern.	<i>Tetrameles</i>	Datisc.
<i>Homalanthus</i> p.p.	Euph.		

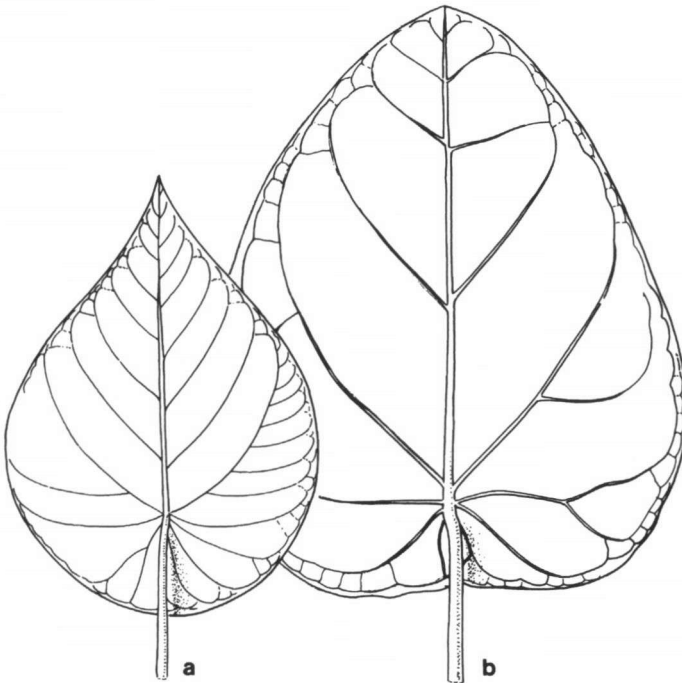


Figure 34. Leaves peltate – a. *Macaranga tanarius*; b. *Hernandia nymphaeifolia*.

52. Leaves bullate

Lamina with veins deeply sunken, so that the upper surface looks bubbly. This list is very incomplete.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acranthera</i>	Rub.	<i>Macaranga</i> p.p.	Euph.
<i>Acsmithia</i> p.p.	Cun.	<i>Mangifera</i> p.p.	Anac.
<i>Aporosa</i> p.p.	Euph.	<i>Melanochyla</i> p.p.	Anac.
<i>Beilschmiedia</i> p.p.	Laur.	<i>Meliosma</i> p.p.	Sab.
<i>Botryophora</i>	Euph.	<i>Myrica</i>	Myric.
<i>Caldcluvia brassii</i>	Cun.	<i>Olearia</i> p.p.	Comp.
<i>Carpodetus</i>	Sax.	<i>Oreomitra</i> p.p.	Cuc.
<i>Cypholophus chamaephyton</i>	Urt.	<i>Oxyspora</i> p.p.	Melast.
<i>Cyrtandra</i> p.p.	Gesn.	<i>Poikilogyne villosa</i>	Melast.
<i>Didissandra</i> p.p.	Gesn.	<i>Polyalthia</i> p.p.	Annon.
<i>Didymocarpus</i> p.p.	Gesn.	<i>Pullea</i> p.p.	Cun.
<i>Dioscorea</i> p.p.	Diosc.	<i>Quercus</i> p.p.	Fagac.
<i>Diospyros</i> p.p.	Eben.	<i>Rhyticaryum</i>	Icacin.
<i>Elaeocarpus</i> p.p.	Elaeoc.	<i>Sericolea</i> p.p.	Elaeoc.
<i>Ficus</i> p.p.	Morac.	<i>Shorea</i> p.p.	Dipt.
<i>Gonystylus areolatus</i>	Thym.	<i>Symplocos</i> p.p.	Sympl.
<i>Helicia bullata</i>	Prot.	<i>Syzygium</i> p.p.	Myrt.
<i>Hydrostemma</i>	Nymph.	<i>Tetractomia</i> p.p.	Rut.
<i>Ilex</i> p.p.	Aquif.	<i>Urophyllum</i> p.p.	Rub.
<i>Kayea</i> p.p.	Gutt.	<i>Weinmannia</i> p.p.	Cun.
<i>Koilocarpus</i> p.p.	Euph.	<i>Willughbeia anomala</i>	Apoc.
<i>Laportea decumana</i>	Urt.	<i>Xanthomyrtus</i> p.p.	Myrt.
<i>Lasianthus</i> p.p.	Rub.	<i>Zygogynum</i> p.p.	Wint.
<i>Lonicera</i> p.p.	Caprif.		

53. Dicots with large leaves — Fig. 35

Adult leaves more than 40 cm long or across as in several species of *Campnosperma* and *Dillenia*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Agrostistachys</i>	Euph.	<i>Meryta</i> p.p. (P)	Aral.
<i>Anakasia</i>	Aral.	<i>Monophyllaea</i> p.p.	Gesn.
<i>Antidesma</i> p.p.	Euph.	<i>Neesia</i> p.p.	Bomb.
<i>Artocarpus</i> p.p.	Morac.	<i>Octamyrtus</i> (Polak 1134, 1256)	Myrt.
<i>Aulandra</i>	Sapot.	<i>Osmoxylon</i> p.p.	Aral.
<i>Barringtonia</i> p.p.	Lecyth.	<i>Parashorea</i> p.p.	Dipt.
<i>Brassaiopsis</i> p.p.	Aral.	<i>Piper</i> p.p.	Piper.
<i>Campnosperma</i> p.p.	Anac.	<i>Poikilospermum</i> p.p.	Urt.
<i>Carica</i> *	Caric.	<i>Polyalthia dolichophylla</i>	Annon.
<i>Codiaeum</i> (Avé 4740)	Euph.	<i>Pothomorphe</i> *	Piper.
<i>Dillenia</i> p.p.	Dill.	<i>Pterospermum</i>	Sterc.
<i>Diplodiscus</i> p.p.	Tiliac.	<i>Saurauia</i> p.p.	Actin.
<i>Dipterocarpus</i> p.p.	Dipt.	<i>Scaphium</i>	Sterc.
<i>Dolicholobium</i> p.p.	Rub.	<i>Schuurmansia</i>	Ochn.
<i>Drypetes</i> p.p.	Euph.	<i>Semecarpus</i> p.p.	Anac.
<i>Elaeocarpus gustaviifolius</i>	Elaeoc.	<i>Shorea</i> p.p.	Dipt.
<i>Ficus</i> p.p.	Morac.	<i>Sterculia</i> p.p.	Sterc.
<i>Garcinia</i> p.p.	Gutt.	<i>Streptocarpus</i>	Gesn.
<i>Goniothalamus</i> p.p.	Annon.	<i>Tapeinosperma</i> p.p.	Myrsin.
<i>Gonystylus areolatus</i>	Thym.	<i>Tectona</i> p.p.	Verb.
<i>Harmsiopanax</i>	Aral.	<i>Trevesia</i> p.p.	Aral.
<i>Macaranga</i> p.p.	Euph.	<i>Trigonostemon sandakanensis</i>	Euph.
<i>Magnolia</i> p.p.	Magn.	<i>Vatica</i> p.p.	Dipt.
<i>Mallotus</i> p.p.?	Euph.	<i>Wetria macrophylla</i>	Euph.
<i>Mammea</i> p.p.	Gutt.	<i>Xanthophyllum adenotus</i>	Polygal.



Figure 35. Dicots with large leaves – *Tapeinosperma* (after Whitmore).

54. Nigrescence

Leaves turning blackish upon drying as in many *Rubiaceae*, *Diospyros* etc.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acranthera</i> p.p.	Rub.	<i>Morinda</i>	Rub.
<i>Annonaceae</i> p.p.	Annon.	<i>Mucuna</i>	Leg.
<i>Apodytes</i>	Icacin.	<i>Myrmecodia</i>	Rub.
<i>Aralidium</i>	Aral.	<i>Pavetta</i> p.p.	Rub.
<i>Argostemma</i> p.p.	Rub.	<i>Pilea</i> p.p.	Urt.
<i>Breynia</i>	Euph.	<i>Pisonia</i>	Nyctag.
<i>Buchnera</i>	Scroph.	<i>Platanthera</i>	Orch.
<i>Calanthe</i>	Orch.	<i>Porterandia</i> p.p.	Rub.
<i>Canthium</i> p.p.	Rub.	<i>Psychotria</i> p.p.	Rub.
<i>Celtis</i>	Ulm.	<i>Rothmannia</i> p.p.	Rub.
<i>Cerbera</i>	Apoc.	<i>Santalum</i>	Sant.
<i>Coprosma</i>	Rub.	<i>Saprosma</i>	Rub.
<i>Dehaasia</i>	Laur.	<i>Scaevola</i>	Good.
<i>Dendromyza</i>	Sant.	<i>Scyphostegia</i>	Scyph.
<i>Diospyros</i> p.p.	Eben.	<i>Striga</i>	Scroph.
<i>Dolichandrone</i>	Bign.	<i>Strychnos</i>	Logan.
<i>Geniostoma</i>	Logan.	<i>Tarennia</i> p.p.	Rub.
<i>Gynochthodes</i>	Rub.	<i>Tournefortia</i>	Borag.
<i>Heliotropium</i>	Borag.	<i>Urophyllum nigricans</i>	Rub.
<i>Hydnophytum</i>	Rub.	<i>Viscum</i>	Visc.
<i>Ixora</i> p.p.	Rub.	<i>Vitex negundo</i>	Verb.
<i>Mastersia</i>	Leg.	<i>Voacanga</i>	Apoc.
<i>Messerschmidia</i>	Borag.	<i>Ximenia</i>	Olacac.

55. Dry leaves yellow

Leaves turning yellow upon drying; very common in *Symplocos* and *Xanthophyllum*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Actephila</i> p.p.	Euph.	<i>Glycosmis</i> p.p.	Rut.
<i>Alangium</i> p.p.	Alang.	<i>Helicia</i> p.p.	Prot.
<i>Anisophyllea</i> p.p.	Rhiz.	<i>Lindsayomyrtus</i>	Myrt.
<i>Aporosa frutescens</i>	Euph.	<i>Memecylon</i> p.p.	Melast.
<i>Ashtonia</i>	Euph.	<i>Polyosma</i> p.p.	Sax.
<i>Baccaurea</i> p.p.	Euph.	<i>Rinorea</i> p.p.	Viol.
<i>Ceratopetalum</i>	Cun.	<i>Symplocos</i> p.p.	Sympl.
<i>Diospyros toposia</i>	Eben.	<i>Syzygium</i> p.p.	Myrt.
<i>Elaeocarpus</i> p.p.	Elaeoc.	<i>Xanthophyllum</i> p.p.	Polygal.
<i>Ficus diversifolia</i>	Morac.		

56. Young leaves red

In many plants the juvenile leaves are red. Unfortunately this is not always mentioned on the labels.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acer</i>	Acer.	<i>Guttiferae</i> p.p.	Gutt.
<i>Anacardiaceae</i> p.p.	Anac.	<i>Lauraceae</i> p.p.	Laur.
<i>Annonaceae</i> p.p.	Annon.	<i>Leguminosae</i> p.p.	Leg.
<i>Connaraceae</i>	Connar.	<i>Myrtaceae</i> p.p.	Myrt.
<i>Dipterocarpaceae</i> p.p.	Dipt.	<i>Sapindaceae</i> p.p.	Sapind.
<i>Ericaceae</i> p.p.	Eric.	<i>Theaceae</i> p.p.	Theac.
<i>Euphorbiaceae</i> p.p.	Euph.		

57. Broken leaves with white threads

This feature is best seen in fresh material. When a leaf is broken the two parts adhere to each other by white threads, the spiral rings of the tracheids or the dried contents of resin ducts.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aleurites</i>	Euph.	<i>Hevea</i> *	Euph.
<i>Annonaceae</i> p.p.	Annon.	<i>Lauraceae</i> p.p.	Laur.
<i>Apocynaceae</i> p.p.	Apoc.	<i>Linostoma</i>	Thym.
<i>Aquilaria</i>	Thym.	<i>Loranthaceae</i> p.p.	Loranth.
<i>Croton</i>	Euph.	<i>Macaranga</i>	Euph.
<i>Euonymus</i>	Celastr.	<i>Mangifera</i> p.p.	Anac.
<i>Eurycoma</i>	Simar.	<i>Moraceae</i>	Morac.
<i>Excoecaria</i>	Euph.	<i>Ochanostachys</i>	Olacac.
<i>Fahrenheitia</i>	Euph.	<i>Sapotaceae</i>	Sapot.
<i>Gnetum</i>	Gnet.		

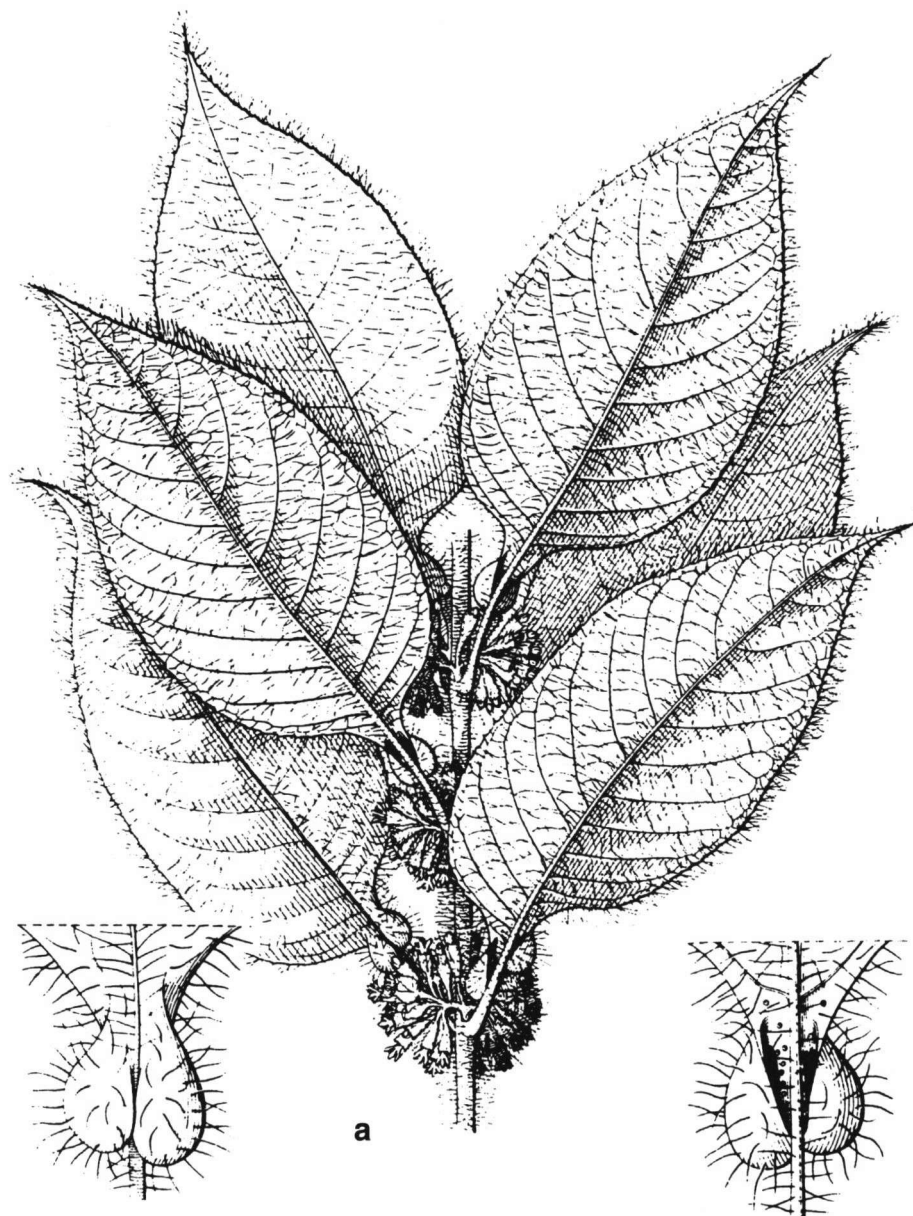


Figure 36. Leaves with domatia – a. *Callicarpa saccata* (Verb.). See also next page.



Figure 36. Leaves with domatia – b. *Guioa pterorhachis* (Sapind.); c. *Lophopyxis maingayi*. See also previous page.

58. Leaves with domatia — Fig. 36

Leaves with hairy or membranous structures on the underside, in the axils of nerves, often inhabited by mites or ants.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acer</i> p.p.	Acer.	<i>Magnoliaceae</i> p.p.	Magn.
<i>Alangium</i>	Alang.	<i>Malvaceae</i> p.p.	Malv.
<i>Anacardiaceae</i> p.p.	Anac.	<i>Mastixia</i>	Corn.
<i>Annonaceae</i> p.p.	Annon.	<i>Melastomataceae</i> p.p.	Melast.
<i>Apocynaceae</i> p.p.	Apoc.	<i>Meliaceae</i> p.p.	Meliac.
<i>Araliaceae</i> p.p.	Aral.	<i>Menispermaceae</i> p.p.	Menisp.
<i>Bignoniaceae</i> p.p.	Bign.	<i>Moraceae</i> p.p.	Morac.
<i>Boraginaceae</i> p.p.	Borag.	<i>Myrtaceae</i> p.p.	Myrt.
<i>Burseraceae</i> p.p.	Burs.	<i>Nyssa</i>	Nyss.
<i>Caprifoliaceae</i> p.p.	Caprif.	<i>Oleaceae</i> p.p.	Olacac.
<i>Celastraceae</i> p.p.	Celastr.	<i>Oleaceae</i> p.p.	Oleac.
<i>Clethra</i>	Clethr.	<i>Piperaceae</i> p.p.	Piper.
<i>Cochlospermum</i>	Cochl.	<i>Polygalaceae</i> p.p.	Polygal.
<i>Combretaceae</i> p.p.	Combr.	<i>Rhamnaceae</i> p.p.	Rhamn.
<i>Compositae</i> p.p.	Comp.	<i>Rosaceae</i> p.p.	Rosac.
<i>Cunoniaceae</i> p.p.	Cun.	<i>Rubiaceae</i> p.p.	Rub.
<i>Dilleniaceae</i> p.p.	Dill.	<i>Rutaceae</i> p.p.	Rut.
<i>Dipterocarpaceae</i> p.p.	Dipt.	<i>Sapindaceae</i> p.p.	Sapind.
<i>Elaeocarpaceae</i> p.p.	Elaeoc.	<i>Sarcosperma</i>	Sarcosp.
<i>Engelhardia</i>	Jugl.	<i>Scrophulariaceae</i> p.p.	Scroph.
<i>Euphorbiaceae</i> p.p.	Euph.	<i>Simaroubaceae</i> p.p.	Simar.
<i>Fagaceae</i> p.p.	Fagac.	<i>Solanaceae</i> p.p.	Solan.
<i>Flacourtiaceae</i> p.p.	Flac.	<i>Sterculiaceae</i> p.p.	Sterc.
<i>Gesneriaceae</i> p.p.	Gesn.	<i>Styracaceae</i> p.p.	Styr.
<i>Hamamelidaceae</i> p.p.	Hamam.	<i>Theaceae</i> p.p.	Theac.
<i>Hernandiaceae</i> p.p.	Hern.	<i>Tiliaceae</i> p.p.	Tiliac.
<i>Icacinaceae</i> p.p.	Icacin.	<i>Ulmaceae</i> p.p.	Ulm.
<i>Ilex</i> p.p.	Aquif.	<i>Urticaceae</i> p.p.	Urt.
<i>Lauraceae</i> p.p.	Laur.	<i>Verbenaceae</i> p.p.	Verb.
<i>Lophopyxis</i>	Loph.	<i>Violaceae</i> p.p.	Viol.
<i>Lythraceae</i> p.p.	Lythr.	<i>Vitaceae</i> p.p.	Vit.

59. Leaves with dots — Fig. 37

The dots become visible when the leaf is held against strong light (use handlens!). They appear as small transparent (*Rutaceae*) or coloured (*Myrsinaceae*) dots.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acanthaceae</i> p.p.	Acanth.	<i>Caesalpinia</i>	Leg.
<i>Aetoxylon</i>	Thym.	<i>Callicarpa</i>	Verb.
<i>Aglaiia</i> p.p.	Meliac.	<i>Cansjera</i>	Opil.
<i>Amyxa</i>	Thym.	<i>Capparis</i>	Capp.
<i>Anacolosa</i>	Olacac.	<i>Carnarvonina</i> (Au)	Prot.
<i>Annonaceae</i> p.p.	Annon.	<i>Casearia</i> p.p.	Flac.
<i>Anogeissus</i> (As)	Combr.	<i>Celtis</i>	Ulm.
<i>Astronia</i>	Melast.	<i>Chionanthus</i> p.p.	Oleac.
<i>Buckinghamia</i> (Au)	Prot.	<i>Cissus</i>	Vit.
<i>Buxus</i> p.p.	Bux.	<i>Colona</i>	Tiliac.

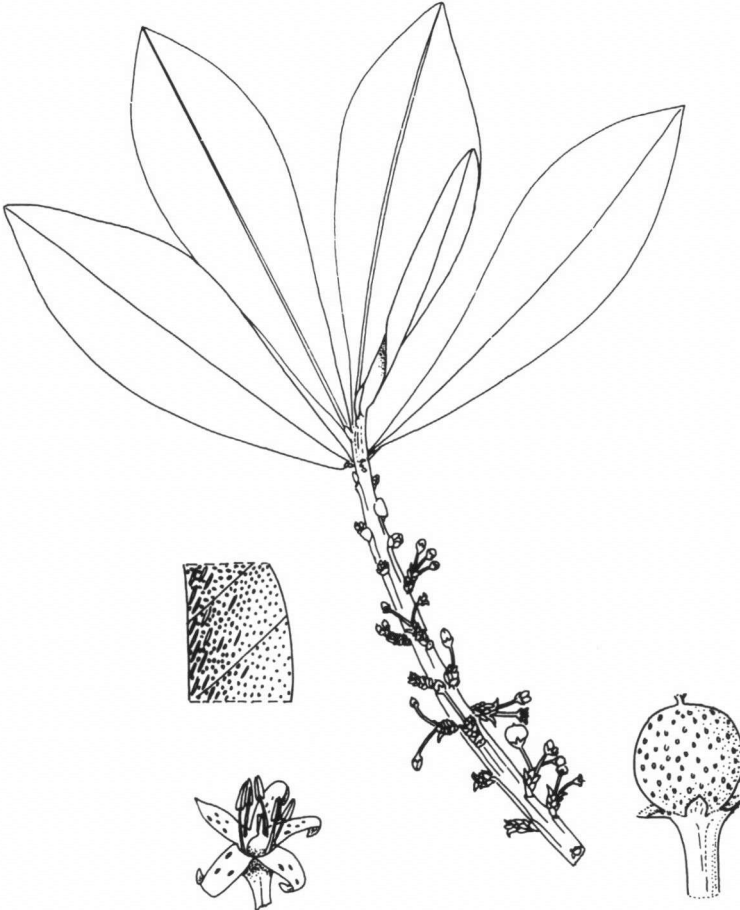


Figure 37. Leaves with dots – *Rapanea involocrata* (Myrsin.) (courtesy Dr. P. van Royen).

(59. Leaves with dots, continued)

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Combretum</i>	Combr.	<i>Mischocarpus</i>	Sapind.
<i>Compositae</i> p.p.	Comp.	<i>Monimiaceae</i>	Monim.
<i>Connarus</i>	Connar.	<i>Morus</i>	Morac.
<i>Cordia</i> p.p.	Borag.	<i>Myoporum</i>	Myopor.
<i>Corynocarpus</i>	Coryn.	<i>Myristica</i> p.p.	Myrist.
<i>Cratoxylum</i>	Gutt.	<i>Myrsinaceae</i> (not <i>Maesa</i>)	Myrsin.
<i>Crotalaria</i>	Leg.	<i>Myrtaceae</i>	Myrt.
<i>Croton</i>	Euph.	<i>Octomeles</i> p.p.	Datisc.
<i>Dendropanax borneensis</i>	Aral.	<i>Osmelia</i> p.p.	Flac.
<i>Derris thyrsiflora</i>	Leg.	<i>Peperomia</i>	Piper.
<i>Diospyros</i> p.p.	Eben.	<i>Piper</i> p.p.	Piper.
<i>Dodonaea</i>	Sapind.	<i>Podocarpus</i> p.p.	Conif.
<i>Drimys</i>	Wint.	<i>Polyosma</i>	Sax.
<i>Elaeocarpus</i> p.p.	Elaeoc.	<i>Pothomorphe</i> *	Piper.
<i>Ficus</i> p.p.	Morac.	<i>Prunus</i> p.p.	Rosac.
<i>Fontainea</i>	Euph.	<i>Psoralea</i>	Leg.
<i>Galbulimima</i>	Himant.	<i>Rutaceae</i>	Rut.
<i>Garcinia</i> p.p.	Gutt.	<i>Ryparosa</i>	Flac.
<i>Geissois</i> (P)	Cun.	<i>Salacia macrophylla</i>	Celastr.
<i>Glochidion</i>	Euph.	<i>Santalaceae</i> p.p.	Sant.
<i>Gnetum</i>	Gnet.	<i>Sarcopteryx</i>	Sapind.
<i>Gonystylus</i>	Thym.	<i>Schisandra</i>	Schis.
<i>Guioa</i>	Sapind.	<i>Scorodocarpus</i>	Olacac.
<i>Heynea</i> p.p.	Meliac.	<i>Smilax</i>	Liliac.
<i>Hypericum</i>	Gutt.	<i>Stixis</i>	Capp.
<i>Icacinaeae</i> p.p.	Icacin.	<i>Suregada</i>	Euph.
<i>Illicium</i>	Illic.	<i>Sympetalandra</i>	Leg.
<i>Illigera</i>	Hern.	<i>Syndiophyllum</i>	Euph.
<i>Jacquemontia</i>	Conv.	<i>Terminalia</i> p.p.	Combr.
<i>Kadsura</i>	Schis.	<i>Ternstroemia</i> p.p.	Theac.
<i>Kingiodendron</i>	Leg.	<i>Tetrastigma</i>	Vit.
<i>Labiatae</i>	Lab.	<i>Timonius</i> p.p.	Rub.
<i>Lauraceae</i> p.p.	Laur.	<i>Trimenia</i>	Trim.
<i>Lysimachia</i> p.p.	Prim.	<i>Urticaceae</i>	Urt.
<i>Mammea</i>	Gutt.	<i>Vitex</i> p.p.	Verb.
<i>Memecylon</i> p.p.	Melast.	<i>Walsura</i> p.p.	Meliac.
<i>Merrilliodendron</i>	Icacin.	<i>Zygogynum</i>	Wint.

60. Leaf surface puncticulate

Leaf with tiny depressions as if pricked with a needle.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acanthus ilicifolius</i>	Acanth.	<i>Eugenia</i> p.p.	Myrt.
<i>Agelaea</i>	Connar.	<i>Hosea</i>	Verb.
<i>Amyxa</i>	Thym.	<i>Macaranga</i> p.p.	Euph.
<i>Anneslea</i>	Theac.	<i>Prunus</i>	Rosac.
<i>Aphanamixis polystachya</i>	Meliac.	<i>Rhododendron</i> p.p.	Eric.
<i>Aporosa</i> p.p.	Euph.	<i>Sarcosperma</i>	Sarcosp.
<i>Avicennia</i>	Verb.	<i>Teijsmanniodendron</i>	Verb.
<i>Chionanthus</i> p.p.	Oleac.	<i>Trimenia macrura</i>	Trim.
<i>Dichapetalum</i>	Dichap.	<i>Viburnum punctatum</i>	Caprif.

61. Leaf surface pustulate

Leaf surface with small raised swellings, often giving the lamina a dull appearance; common in *Loranthaceae* and *Olacaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Euphorbiaceae</i> p.p.	Euph.	<i>Loranthaceae</i> p.p.	Loranth.
<i>Fagraea</i> p.p.	Logan.	<i>Memecylon</i> p.p.	Melast.
<i>Flacourtiaceae</i> p.p.	Flac.	<i>Olacaceae</i>	Olacac.
<i>Horsfieldia</i> p.p.	Myrist.	<i>Opiliaceae</i>	Opil.
<i>Icacinales</i> p.p.	Icacin.	<i>Popowia</i>	Annon.
<i>Jasminum</i> p.p.	Oleac.		

62. Leaf surface rough

Leaf surface very rough to the touch, hence the term 'sandpaper' leaves; common in several species of *Ficus* and *Tetracera*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Artocarpus</i> p.p.	Morac.	<i>Horsfieldia grandis</i>	Myrist.
<i>Broussonetia</i> *	Morac.	<i>Hullettia</i>	Morac.
<i>Claoxylon</i> p.p.	Euph.	<i>Macaranga trachyphylla</i>	Euph.
<i>Cucurbitaceae</i> p.p.	Cuc.	<i>Tetracera</i> p.p.	Dill.
<i>Didymocarpus</i> p.p.	Gesn.	<i>Trema cannabina</i>	Ulm.
<i>Dillenia pentagyna</i>	Dill.	<i>Urticaceae</i> p.p.	Urt.
<i>Ficus</i> p.p.	Morac.	<i>Wedelia asperima</i>	Comp.
<i>Homalomena asperifolia</i>	Arac.		

63. Cystoliths

Leaves provided with cells containing silica crystals, visible as raised pale dots or dashes (use handlens).

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acanthaceae</i> p.p.	Acanth.	<i>Hedyotis</i>	Rub.
<i>Amaracarpus</i>	Rub.	<i>Mallotus</i> p.p.	Euph.
<i>Argostemma</i>	Rub.	<i>Melastoma</i> p.p.	Melast.
<i>Arisaema</i>	Arac.	<i>Moraceae</i> p.p.	Morac.
<i>Astronia</i> p.p.	Melast.	<i>Mycetia</i>	Rub.
<i>Astronidium</i> p.p.	Melast.	<i>Nertera</i>	Rub.
<i>Baliospermum</i>	Euph.	<i>Piper</i> p.p.	Piper.
<i>Bougainvillea</i> *	Nyctag.	<i>Rhaphidophora</i> p.p.	Arac.
<i>Cordia</i>	Borag.	<i>Saurauia</i>	Actin.
<i>Cryptocoryne</i>	Arac.	<i>Urticaceae</i>	Urt.
<i>Dioscorea</i> p.p.	Diosc.		

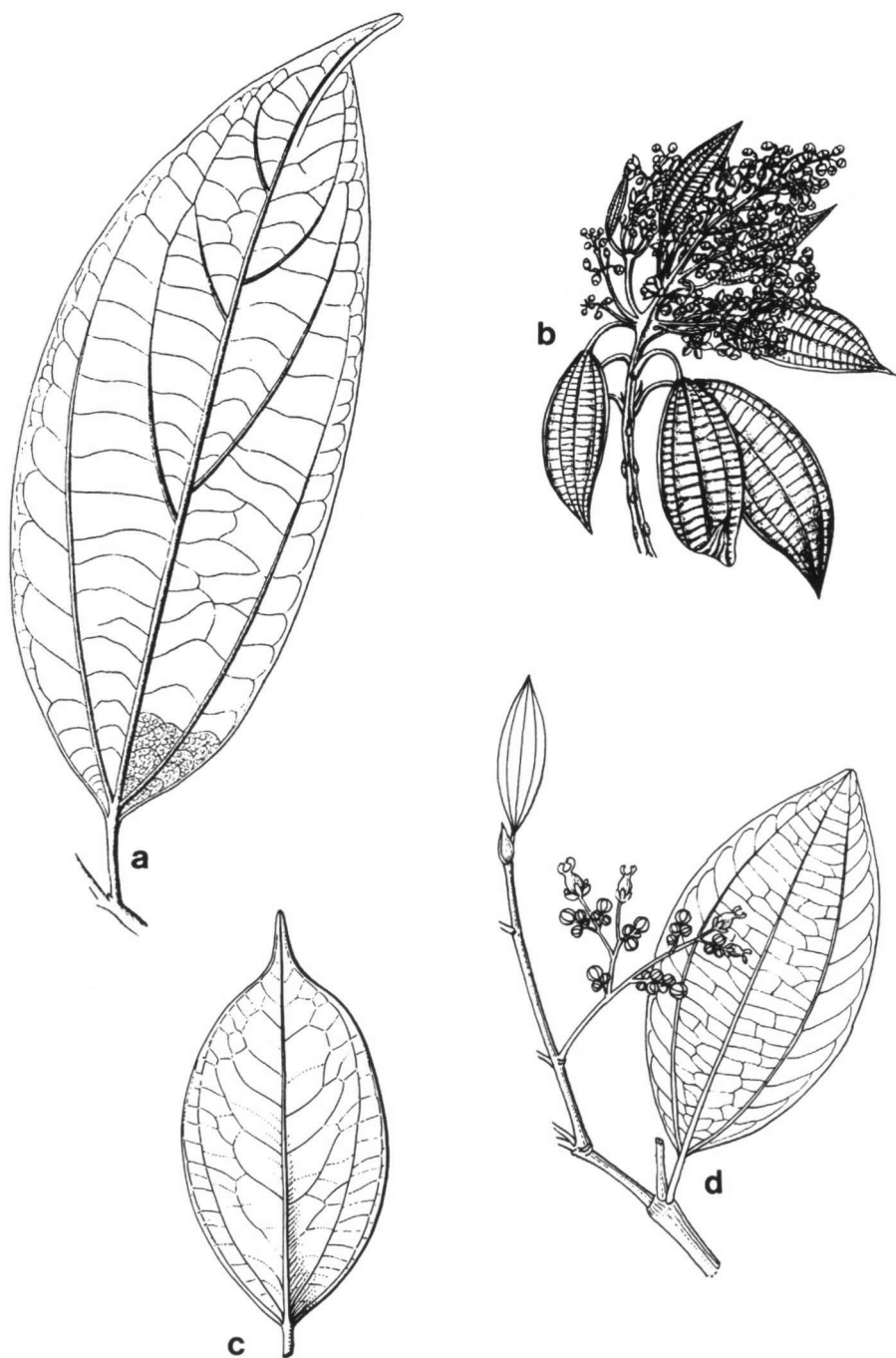


Figure 38. Leaves triplinerved – a. *Cryptocarya densiflora*; b. *Astronia spectabilis* (Melast.); c. *Anisophyllea disticha*; d. *Celtis philippensis*.

64. Leaves triplinerved — Fig. 38

Leaves with a pair of opposite veins at the base, which may reach the top of the lamina (e.g. *Cinnamomum*) or end somewhere in the leaf margin (e.g. *Ficus*).

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Adenia</i>	Passifl.	<i>Gomphandra quadrifida</i>	
<i>Alangium</i> p.p.	Alang.	var. <i>triplinervis</i>	Icacin.
<i>Amyema</i> p.p.	Loranth.	<i>Grewia</i> p.p.	Tiliac.
<i>Anisophyllea</i>	Rhiz.	<i>Jasminum</i> p.p.	Oleac.
<i>Austromuellera</i> (Au)	Prot.	<i>Leptonychia</i>	Sterc.
<i>Berrya</i>	Tiliac.	<i>Leucosyke</i>	Urt.
<i>Blumeodendron</i> p.p.	Euph.	<i>Lindera</i> p.p.	Laur.
<i>Boehmeria</i>	Urt.	<i>Macaranga</i> p.p.	Euph.
<i>Brachychiton</i> p.p.	Sterc.	<i>Mallotus</i> p.p.	Euph.
<i>Brackenridgea</i>	Ochn.	<i>Maoutia</i>	Urt.
<i>Brownlowia</i>	Tiliac.	<i>Melastomataceae</i> p.p.	Melast.
<i>Callitriche</i>	Callitr.	<i>Microcos</i>	Tiliac.
<i>Caryodaphnopsis</i>	Laur.	<i>Myxopyrum</i>	Oleac.
<i>Celtis</i>	Ulm.	<i>Neolitsea</i> p.p.	Laur.
<i>Cinnamomum</i> p.p.	Laur.	<i>Notothixos</i>	Visc.
<i>Clematis</i>	Ranunc.	<i>Osmelia</i>	Flac.
<i>Cocculus laurifolius</i>	Menisp.	<i>Palmeria</i>	Monim.
<i>Colona</i>	Tiliac.	<i>Pentace</i> p.p.	Tiliac.
<i>Colubrina anomala</i>	Rhamn.	<i>Piper</i>	Piper.
<i>Commersonia</i>	Sterc.	<i>Pipturus</i>	Urt.
<i>Coriaria</i>	Coriar.	<i>Pouzolzia</i>	Urt.
<i>Crawfordia</i>	Gent.	<i>Rhodammia</i>	Myrt.
<i>Cryptocarya</i> p.p.	Laur.	<i>Rhodomyrtus</i>	Myrt.
<i>Cucurbitaceae</i> p.p.	Cuc.	<i>Ryparosa</i>	Flac.
<i>Debregeasia</i>	Urt.	<i>Salomonina</i>	Polygal.
<i>Dendrocnide</i> p.p.	Urt.	<i>Sarcococca</i>	Bux.
<i>Dioscorea</i>	Diosc.	<i>Schoepfia</i>	Oleac.
<i>Diplodiscus</i>	Tiliac.	<i>Schoutenia</i>	Tiliac.
<i>Diplycosia</i>	Eric.	<i>Scolopia</i> p.p.	Flac.
<i>Disporum</i>	Liliac.	<i>Scorodocarpus</i>	Olacac.
<i>Ericaceae</i> p.p.	Eric.	<i>Smilax</i>	Liliac.
<i>Erythralum</i>	Olacac.	<i>Stemona</i>	Stem.
<i>Erythrospermum</i>	Flac.	<i>Sterculia</i>	Sterc.
<i>Exacum</i>	Gent.	<i>Strychnos</i>	Logan.
<i>Faradaya</i>	Verb.	<i>Thottea</i>	Arist.
<i>Fatoua</i>	Morac.	<i>Thunbergia</i>	Acanth.
<i>Ficus</i> p.p.	Morac.	<i>Trema</i>	Ulm.
<i>Galium</i>	Rub.	<i>Trewia</i>	Euph.
<i>Gaultheria</i>	Eric.	<i>Trichospermum</i>	Tiliac.
<i>Gentiana</i>	Gent.	<i>Trigonostemon</i> p.p.	Euph.
<i>Gibbsia</i>	Urt.	<i>Villebrunea</i>	Urt.
<i>Ginalloa</i>	Visc.	<i>Viscum</i>	Visc.
		<i>Zizyphus</i>	Rhamn.

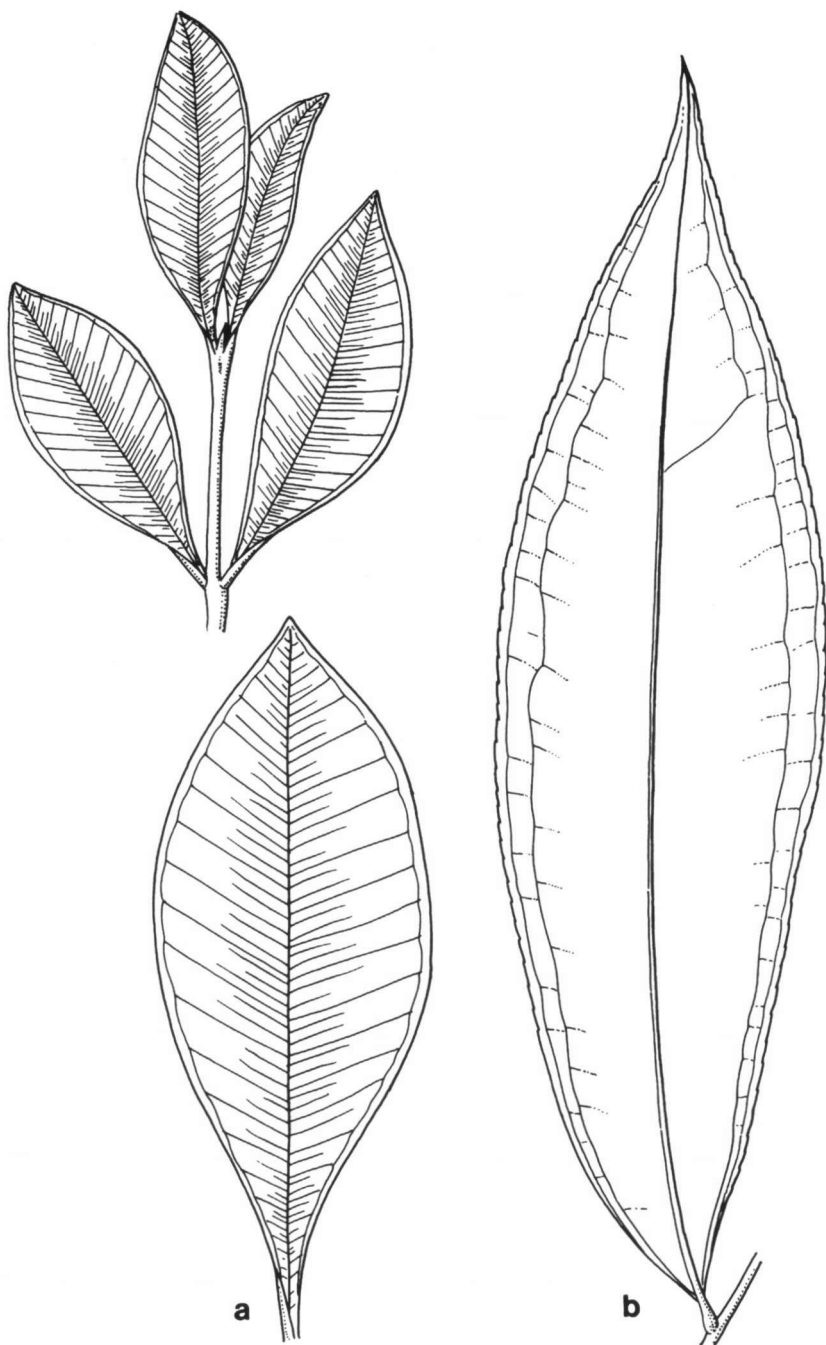


Figure 39. a. Intramarginal vein – *Eugenia suringariana* (Myrt.). — b. Double intramarginal vein – *Gomphia serrata*.

65. Intramarginal vein — Fig. 39a

A vein running parallel to the margin of the lamina (e.g. *Eugenia s. l.*). The distinction between a triplinerved leaf, a leaf with intramarginal vein and one in which the veins are looped and joined is not always easy to observe.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Anisophyllea</i>	Rhiz.	<i>Leuconotis</i>	Apoc.
<i>Bridelia</i>	Euph.	<i>Memecylon</i> p.p.	Melast.
<i>Buxaceae</i>	Bux.	<i>Monocarpia</i>	Annon.
<i>Chilocarpus</i>	Apoc.	<i>Myrtaceae</i>	Myrt.
<i>Crypteroniaceae</i>	Crypter.	<i>Sapotaceae</i> p.p.	Sapot.
<i>Drimycarpus</i>	Anac.	<i>Scaphocalyx</i>	Flac.
<i>Duabanga</i>	Sonn.	<i>Spondias</i> p.p.	Anac.
<i>Finschia</i>	Prot.	<i>Swintonia</i>	Anac.
<i>Gomphia</i>	Ochn.		

66. Double intramarginal vein — Fig. 39b

Two veins running parallel to the leaf margin, e.g. in *Gomphia*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Axinandra</i>	Crypter.	<i>Octamyrtus</i> p.p.	Myrt.
<i>Buxus</i> p.p.	Bux.	<i>Pedicellarum</i>	Arac.
<i>Decaspermum</i> p.p.	Myrt.	<i>Pothos</i>	Arac.
<i>Gomphia</i>	Ochn.	<i>Syzygium</i> p.p.	Myrt.
<i>Nepenthes</i>	Nepenth.	<i>Whiteodendron</i>	Myrt.

67. Parallel secondary venation — Fig. 40

Leaves with very close parallel veins; *Calophyllum* is the best known example.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Alstonia</i>	Apoc.	<i>Linostoma</i>	Thym.
<i>Amyxa</i>	Thym.	<i>Mimusops</i> p.p.	Sapot.
<i>Aquilaria</i>	Thym.	<i>Musa</i>	Musac.
<i>Calophyllum</i>	Gutt.	<i>Neckia</i>	Ochn.
<i>Carallia caryophylloidea</i>	Rhiz.	<i>Palaquium</i> p.p.	Sapot.
<i>Chrysophyllum</i> p.p.	Sapot.	<i>Payena</i> p.p.	Sapot.
<i>Dryobalanops</i>	Dipt.	<i>Reinwardtiadendron humile</i>	Meliac.
<i>Euthemis</i>	Ochn.	<i>Schuurmansia</i>	Ochn.
<i>Ficus</i> p.p.	Morac.	<i>Schuurmansiaella</i>	Ochn.
<i>Garcinia</i> p.p.	Gutt.	<i>Sericolea</i> p.p.	Elaeoc.
<i>Gonystylus</i>	Thym.	<i>Severinia</i> p.p.	Rut.
<i>Gyrinops caudata</i>	Thym.	<i>Tephrosia</i> p.p.	Leg.
<i>Hopea</i> p.p.	Dipt.	<i>Timonius</i> p.p.	Rub.
<i>Indovethia</i>	Ochn.	<i>Wetria</i>	Euph.
<i>Kayea calophylloides</i>	Gutt.		

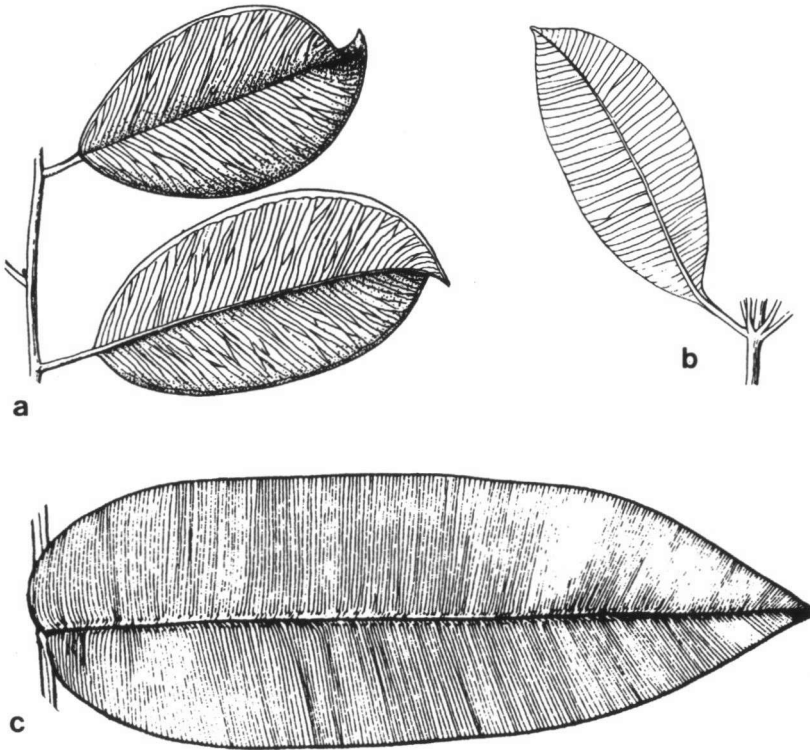
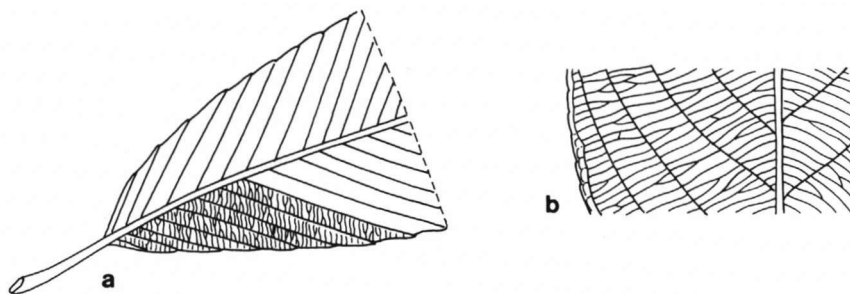


Figure 40. Parallel secondary venation – a. *Gonystylus bancanus*; b. *Alstonia angustiloba*; c. *Calophyllum complanatum*.

Figure 41. Scalariform venation – a. *Dillenia indica*; b. *Rinorea horneri*.

68. Scalariform venation — Fig. 41

The tertiary veins are close and parallel (ladder-like), common in *Rhamnaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Alphitonia</i>	Rhamn.	<i>Macaranga</i>	Euph.
<i>Antidesma</i> p.p.	Euph.	<i>Maesopsis</i> *	Rhamn.
<i>Aporosa</i> p.p.	Euph.	<i>Mallotus</i>	Euph.
<i>Atuna</i>	Chrys.	<i>Maranthes</i>	Chrys.
<i>Baccaurea</i> p.p.	Euph.	<i>Melastomataceae</i> p.p.	Melast.
<i>Berchemia</i>	Rhamn.	<i>Neobalanocarpus</i>	Dipt.
<i>Bhesa</i>	Celastr.	<i>Parashorea</i>	Dipt.
<i>Bridelia</i>	Euph.	<i>Parinari</i>	Chrys.
<i>Colubrina</i>	Rhamn.	<i>Rhamnella</i>	Rhamn.
<i>Combretaceae</i> p.p.	Combr.	<i>Rhamnus</i>	Rhamn.
<i>Desmodium</i> p.p.	Leg.	<i>Rinorea</i> p.p.	Viol.
<i>Dilleniaceae</i> p.p.	Dill.	<i>Sageretia</i>	Rhamn.
<i>Dipterocarpus</i>	Dipt.	<i>Sapotaceae</i> p.p.	Sapot.
<i>Emmenosperma</i>	Rhamn.	<i>Scorodocarpus</i>	Olacac.
<i>Enkleia</i>	Thym.	<i>Shorea</i> p.p.	Dipt.
<i>Flemingia</i>	Leg.	<i>Smythea</i>	Rhamn.
<i>Gouania</i>	Rhamn.	<i>Stemona</i>	Stem.
<i>Grewia</i>	Tiliac.	<i>Upuna</i>	Dipt.
<i>Hopea</i> p.p.	Dipt.	<i>Ventilago</i>	Rhamn.
<i>Irvingia</i>	Simar.	<i>Zizyphus</i>	Rhamn.
<i>Lasianthus</i>	Rub.		

69. Leaves withering red

This is again a feature not visible in the herbarium and one depends on completeness of the label. A good example is provided by *Elaeocarpus*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acer</i>	Acer.	<i>Lagerstroemia</i>	Lythr.
<i>Elaeocarpus</i>	Elaeoc.	<i>Sapium</i>	Euph.
<i>Greenea</i>	Rub.	<i>Terminalia</i>	Combr.
<i>Homalanthus</i>	Euph.	<i>Wendlandia</i>	Rub.

INFLORESCENCE (characters 70–78)

70. Cauliflorous plants — Fig. 42

Plants with the inflorescences borne on the stem or trunk. This is not always clear in a herbarium specimen. So, the condition should be stated on the label.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Actinorhysis</i>	Palm.	<i>Aulandra</i>	Sapot.
<i>Aglaia</i> p.p.	Meliac.	<i>Averrhoa</i> p.p.	Oxal.
<i>Alchornea borneensis</i>	Euph.	<i>Baccaurea</i> p.p.	Euph.
<i>Anacolosia cauliflora</i>	Olacac.	<i>Barringtonia</i> p.p.	Lecyth.
<i>Anamirta</i>	Menisp.	<i>Bellucia</i> *	Melast.
<i>Annona</i> p.p.*	Annon.	<i>Callerya</i>	Leg.
<i>Antidesma</i> p.p.	Euph.	<i>Callicarpa</i> p.p.	Verb.
<i>Arcangelisia</i>	Menisp.	<i>Caryota</i>	Palm.
<i>Archidendron</i> p.p.	Leg.	<i>Chisocheton</i> p.p.	Meliac.
<i>Areca</i>	Palm.	<i>Chlaenandra</i>	Menisp.
<i>Arenga</i>	Palm.	<i>Coscinium</i> p.p.	Menisp.
<i>Artabotrys</i> p.p.	Annon.	<i>Couroupita</i> *	Lecyth.
<i>Artocarpus</i> p.p.	Morac.	<i>Cyathocalyx biovulatus</i>	Annon.

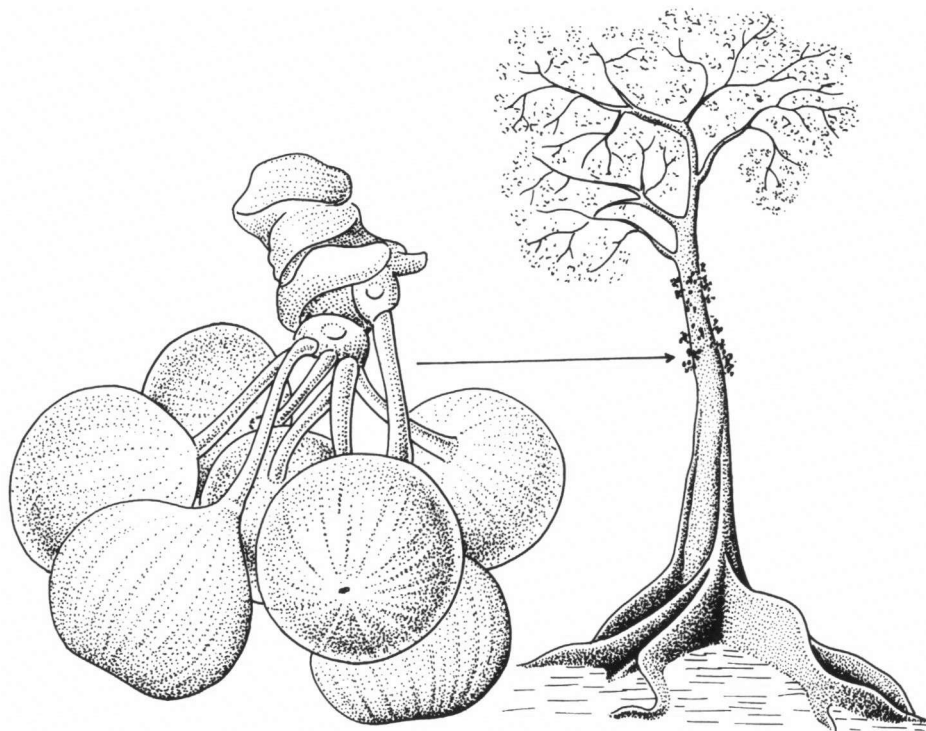


Figure 42. Cauliflorous plants — *Ficus variegata*.

(70. Cauliflorous plants, continued)

Taxon	Family	Taxon	Family
<i>Cyathostemma</i>	Annon.	<i>Palaquium beccarii</i>	Sapot.
<i>Cyclea</i>	Menisp.	<i>Pandanus</i> p.p.	Pand.
<i>Cynometra cauliflora</i>	Leg.	<i>Parmentiera</i> *	Bign.
<i>Cyrtandra</i> p.p.	Gesn.	<i>Phaleria</i> p.p.	Thym.
<i>Cyrtostachys</i>	Palm.	<i>Phyllanthus acidus</i>	Euph.
<i>Diospyros</i> p.p.	Eben.	<i>Phytocrene</i> p.p.	Icacin.
<i>Diplocisia</i>	Menisp.	<i>Pimelodendron macrocarpum</i>	Euph.
<i>Drypetes</i> p.p.	Euph.	<i>Pinanga</i>	Palm.
<i>Durio</i> p.p.	Bomb.	<i>Pisonia</i> p.p.	Nyctag.
<i>Dysoxylum</i> p.p.	Meliac.	<i>Planchonella keyensis</i> p.p.	Sapot.
<i>Enicosanthum</i> p.p.	Annon.	<i>Polyalthia</i> p.p.	Annon.
<i>Eugenia</i> p.p.	Myrt.	<i>Praravinia suberosa</i>	Rub.
<i>Evodia</i> p.p.	Rut.	<i>Premna</i> p.p.	Verb.
<i>Faradaya</i> p.p.	Oleac.	<i>Pseudobotrys</i>	Icacin.
<i>Ficus</i> p.p.	Morac.	<i>Ptychopyxis grandiflorus</i>	Euph.
<i>Fordia</i> p.p.	Leg.	<i>Quassia</i> p.p.	Simar.
<i>Forrestia</i>	Comm.	<i>Radermachera</i> p.p.	Bign.
<i>Galearia celebica</i> p.p.	Euph.	<i>Rhopaloblaste</i>	Palm.
<i>Glochidion</i> p.p.	Euph.	<i>Rhynchotechum</i>	Gesn.
<i>Gnetum</i> p.p.	Gnet.	<i>Ryparosa</i> p.p.	Flac.
<i>Goniothalamus</i> p.p.	Annon.	<i>Saraca</i>	Leg.
<i>Gonocaryum</i> p.p.	Icacin.	<i>Sarcopetalum</i>	Menisp.
<i>Haematocarpus</i> p.p.	Menisp.	<i>Saurauia</i> p.p.	Actin.
<i>Helicia</i> p.p.	Prot.	<i>Sauropus</i> p.p.	Euph.
<i>Heliciopsis</i> p.p.	Prot.	<i>Scaphocalyx</i>	Flac.
<i>Illicium</i> p.p.	Illic.	<i>Schefflera</i> p.p. (Burley 3346)	Aral.
<i>Ixora</i> p.p.	Rub.	<i>Scleropyrum</i>	Sant.
<i>Kadsura</i>	Schis.	<i>Semecarpus</i> p.p.	Anac.
<i>Lansium</i> p.p.	Meliac.	<i>Stegantthera</i> p.p.	Monim.
<i>Lepisanthes</i> p.p.	Sapind.	<i>Stelechocarpus</i>	Annon.
<i>Litsea</i> p.p.	Laur.	<i>Stephania</i>	Menisp.
<i>Lycianthes</i> p.p.	Solan.	<i>Sterculia</i> p.p.	Sterc.
<i>Macrocculus</i>	Menisp.	<i>Stichianthus</i>	Rub.
<i>Magodendron</i>	Sapot.	<i>Strongylodon</i> p.p.	Leg.
<i>Mammea woodii</i>	Gutt.	<i>Tetrastigma</i>	Vit.
<i>Mayodendron igneum</i> (As)	Bign.	<i>Theobroma</i> *	Sterc.
<i>Melientha</i>	Opil.	<i>Tiliacora</i>	Menisp.
<i>Merrilliodendron</i>	Icacin.	<i>Tinomiscium</i>	Menisp.
<i>Moultonia</i>	Gesn.	<i>Trigonostemon capillipes</i>	Euph.
<i>Mucuna</i> p.p.	Leg.	<i>Urophyllum</i> p.p.	Rub.
<i>Nenga</i>	Palm.	<i>Uvaria</i>	Annon.
<i>Octamyrtus</i> p.p.	Myrt.	<i>Versteeghia</i>	Rub.
<i>Oncosperma</i>	Palm.	<i>Wallichia</i>	Palm.
<i>Opuntia</i> *	Cact.		



Figure 43. Inflorescence fasciculate, leaves distichous – a. *Scorodocarpus borneensis*; b. *Rinorea horneri*; c. *Lindera lucida*.

71. Inflorescence fasciculate, leaves distichous — Fig. 43

This combination is characteristic for many genera in various families, e.g. *Euphorbiaceae* and *Flacourtiaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Actephila</i> p.p.	Euph.	<i>Knema</i>	Myrist.
<i>Anacolosia</i> p.p.	Olacac.	<i>Leptopus</i>	Euph.
<i>Aporosa</i> p.p.	Euph.	<i>Lindera</i> p.p.	Laur.
<i>Boehmeria</i> p.p.	Urt.	<i>Litsea</i> p.p.	Laur.
<i>Breynia</i>	Euph.	<i>Margaritaria</i>	Euph.
<i>Bridelia</i>	Euph.	<i>Microdesmis</i>	Euph.
<i>Casearia</i>	Flac.	<i>Myristica</i> p.p.	Myrist.
<i>Chaetocarpus</i>	Euph.	<i>Paropsia</i> p.p.	Passifl.
<i>Chamabainia</i>	Urt.	<i>Phyllanthus</i>	Euph.
<i>Cleistanthus</i> p.p.	Euph.	<i>Pouzolzia</i>	Urt.
<i>Cypholophus</i>	Urt.	<i>Procris</i> p.p.	Urt.
<i>Dichapetalum</i> p.p.	Dichap.	<i>Rapanea</i>	Myrsin.
<i>Diospyros</i> p.p.	Eben.	<i>Rinorea</i> p.p.	Viol.
<i>Drypetes</i> p.p.	Euph.	<i>Sapotaceae</i> p.p.	Sapot.
<i>Elatostema</i>	Urt.	<i>Sauropus</i>	Euph.
<i>Ellipanthus</i> p.p.	Connar.	<i>Scolopia</i> p.p.	Flac.
<i>Flueggea</i>	Euph.	<i>Scorodocarpus</i>	Olac.
<i>Glochidion</i> p.p.	Euph.	<i>Sebastiania</i> p.p.	Euph.
<i>Gonostegia</i>	Urt.	<i>Strombosia</i>	Olacac.
<i>Gyrinops</i> p.p.	Thym.	<i>Suregada</i>	Euph.
<i>Hemiscolopia</i>	Flac.	<i>Trigonopleura</i>	Euph.
<i>Hydnocarpus</i> p.p.	Flac.	<i>Trigonostemon</i> p.p.	Euph.
<i>Kairothamnus</i>	Euph.	<i>Ximenia</i> p.p.	Olacac.

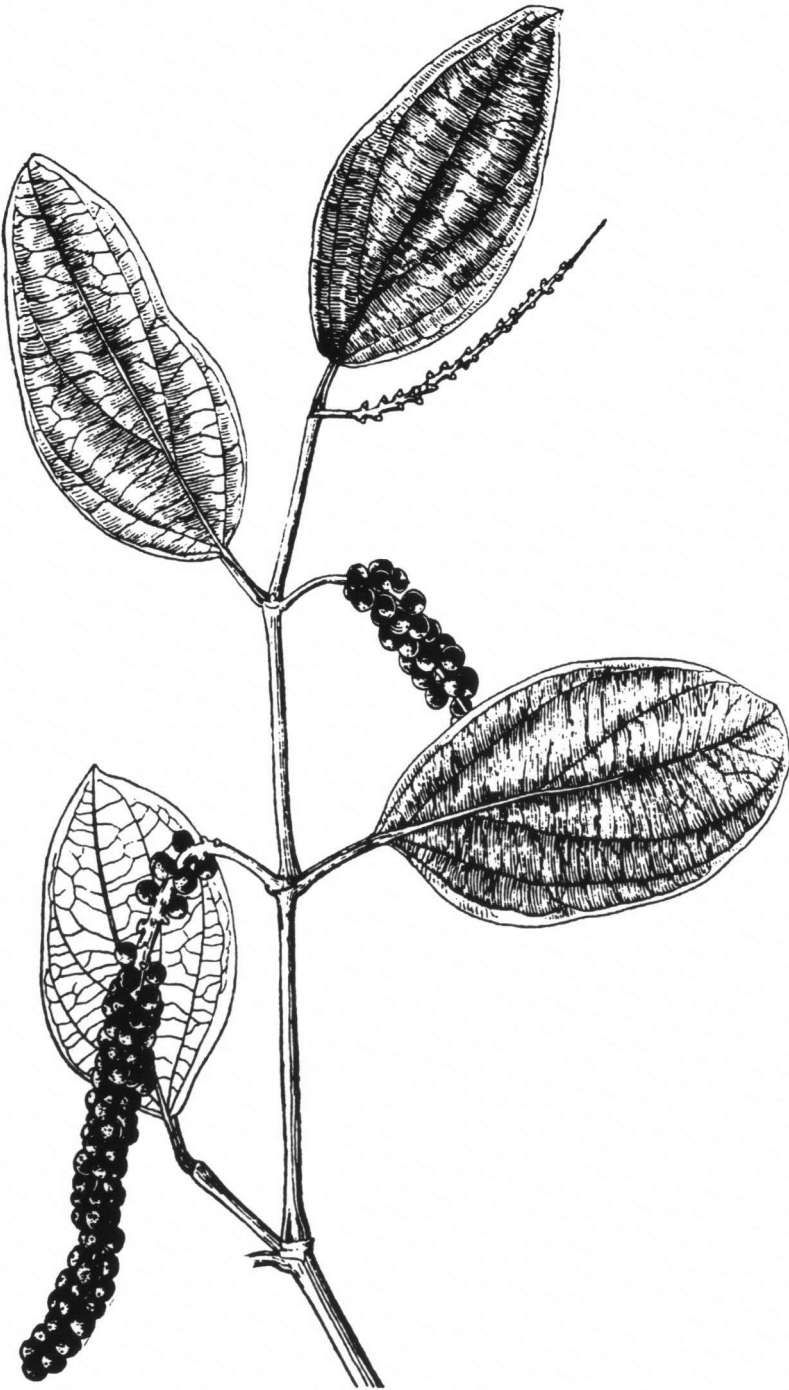


Figure 44. Inflorescence leaf-opposed – *Piper nigrum*.

72. Inflorescence leaf-opposed — Fig. 44

Inflorescence borne opposite the leaf instead of in the leaf axil. Well known examples are *Piper* and *Suregada*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Abroma</i> p.p.	Sterc.	<i>Lycianthes</i> p.p.	Solan.
<i>Allmannia</i>	Amaran.	<i>Macaranga</i> p.p.	Euph.
<i>Ampelocissus</i>	Vit.	<i>Magnoliaceae</i> p.p.	Magn.
<i>Anaxagorea</i> p.p.	Annon.	<i>Mallotus</i> p.p.	Euph.
<i>Aporosa</i>	Euph.	<i>Monocarpia</i> p.p.	Annon.
<i>Cissus</i>	Vit.	<i>Pelargonium</i> *	Geran.
<i>Commersonia</i>	Sterc.	<i>Peperomia</i> p.p.	Piper.
<i>Commelinaceae</i> p.p.	Comm.	<i>Piper</i> p.p.	Piper.
<i>Cyathocalyx</i> p.p.	Annon.	<i>Plukenetia</i> p.p.	Euph.
<i>Fissistigma</i> p.p.	Annon.	<i>Solanum</i> p.p.	Solan.
<i>Gomphandra</i> p.p.	Icacin.	<i>Spathiostemon</i> p.p.	Euph.
<i>Houttuynia</i> p.p. *	Saur.	<i>Suregada</i>	Euph.
<i>Leguminosae</i> p.p.	Leg.	<i>Zippelia</i> p.p.	Piper.
<i>Lepiniopsis</i>	Apoc.		

73. Inflorescence supra-axillary — See Fig. 16, p. 38

Inflorescence (or flower) not in the leaf axil but above it, e.g. *Glyptopetalum*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aidia</i>	Rub.	<i>Gaertnera</i> p.p.	Rub.
<i>Annonaceae</i> p.p.	Annon.	<i>Gardenia</i> p.p.	Rub.
<i>Capparis</i> p.p.	Capp.	<i>Glyptopetalum</i>	Celastr.
<i>Chionanthus</i>	Oleac.	<i>Hydnocarpus</i> p.p.	Flac.
<i>Citronella</i> p.p.	Icacin.	<i>Neckia</i>	Ochn.
<i>Cowiea</i>	Rub.	<i>Oleaceae</i> p.p.	Oleac.
<i>Diospyros</i> p.p.	Eben.	<i>Polygala</i> p.p.	Polygal.
<i>Fordia</i>	Leg.	<i>Stichianthus</i>	Rub.

74. Inflorescence epiphyllous — Fig. 45

Stalk of inflorescence (or flower) fused with leaf. Very rare in Malesia. A good example is *Ruthiella*.

<i>Taxon</i>	<i>Family</i>
<i>Chisocheton</i> p.p.	Meliac.
<i>Didissandra morganii</i>	Gesn.
<i>Helwingia</i> *	Corn.
<i>Monophyllaea</i>	Gesn.
<i>Neuropeltopsis</i>	Conv.
<i>Ruthiella</i>	Camp.
<i>Solanum</i> p.p.	Solan.
<i>Trianthema portulacastrum</i>	Aizoac.
<i>Turnera</i> *	Turn.



Figure 45. Inflorescence epiphyllous — *Ruthiella nigrum*.

75. Geocarpous plants — Fig. 46

Inflorescence subterranean, as in some species of *Ficus*, or originally above ground entering the soil later as in *Arachis*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Arachis</i> *	Leg.	<i>Goniothalamus</i> p.p.	Annon.
<i>Artocarpus</i> p.p.?	Morac.	<i>Neocolletia</i>	Leg.
<i>Commelina benghalensis</i>	Comm.	<i>Saurauia</i> p.p.	Actin.
<i>Cyrtandra</i> p.p.	Gesn.	<i>Uvaria</i> p.p.	Annon.
<i>Desmos</i> p.p.	Annon.	<i>Vigna</i> p.p.	Leg.
<i>Enicosanthum</i> p.p.	Annon.	<i>Voandzeia</i> *	Leg.
<i>Ficus</i> p.p.	Morac.	<i>Zingiberaceae</i> p.p.	Zing.

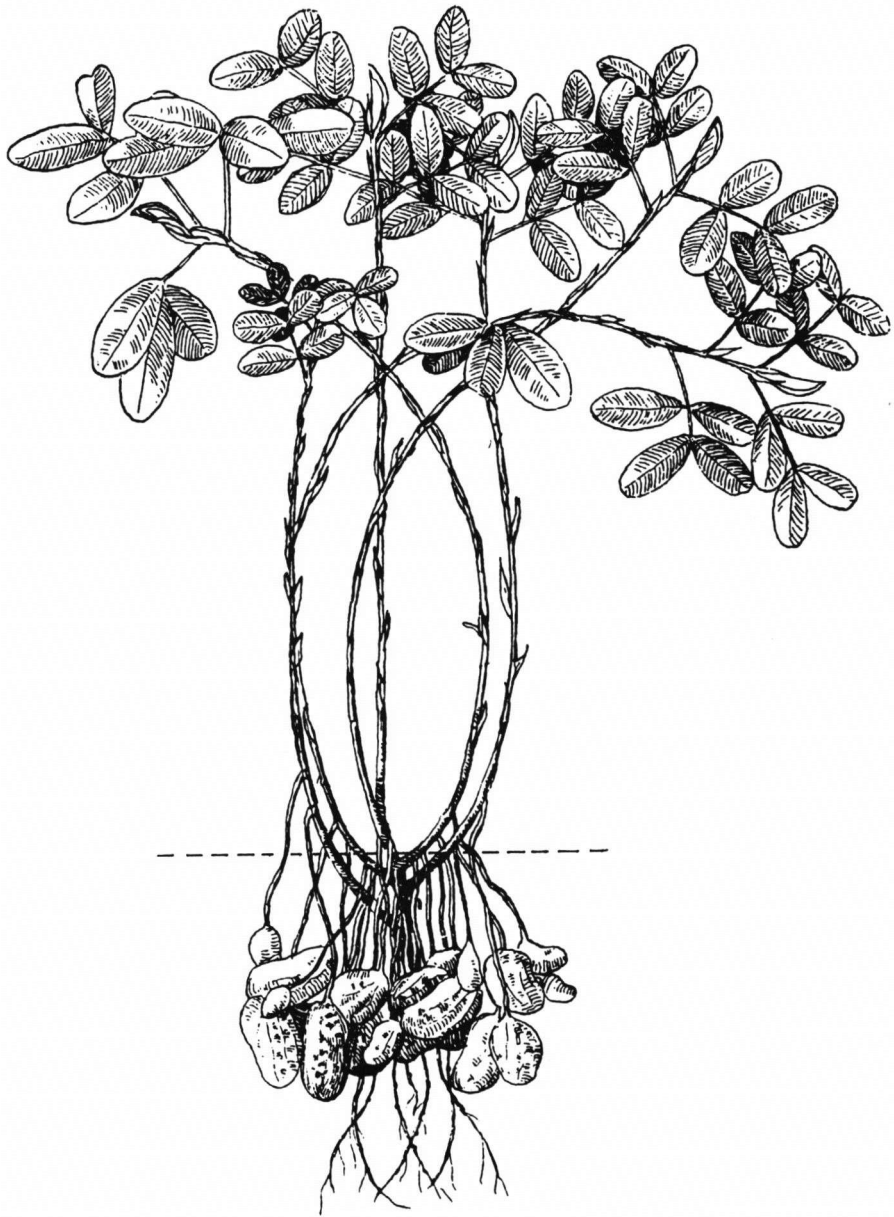


Figure 46. Geocarpous plants – *Arachis hypogaea*.

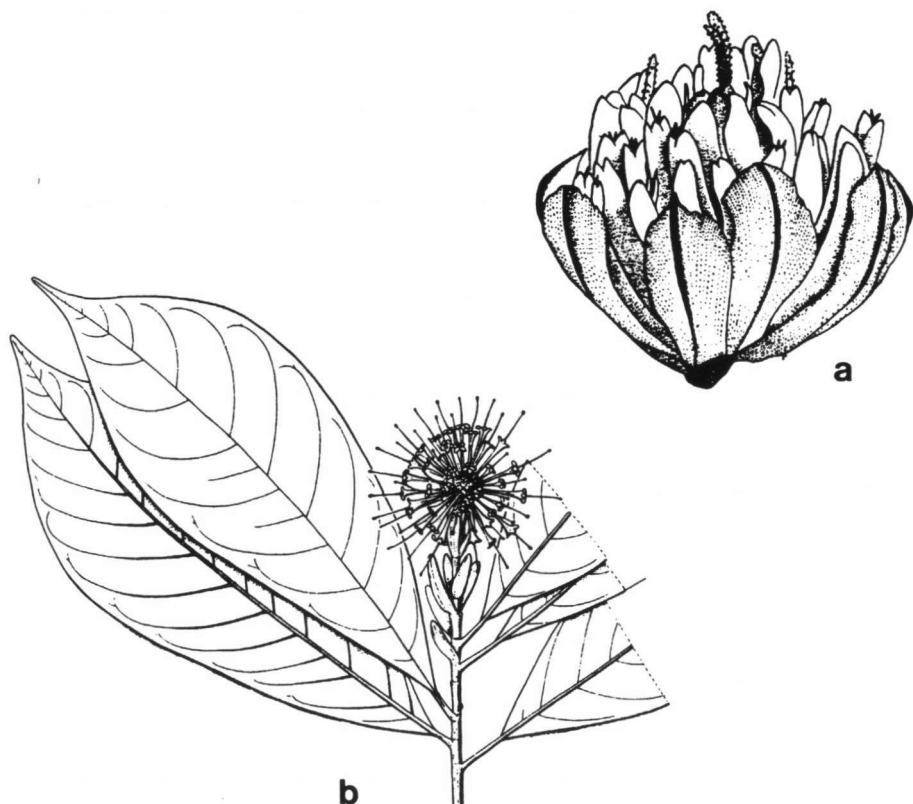


Figure 47. Inflorescence compact – a. *Sphaeranthus africanus* (Comp.); b. *Myrmeconaula stipulacea* (Rub.).

76. Inflorescence compact — Fig. 47

Flowers sitting tightly together in a head as in *Compositae*, *Uncaria* etc.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Actinodaphne</i>	Laur.	<i>Cephalomappa</i>	Euph.
<i>Altingia</i>	Hamam.	<i>Ceuthostoma</i>	Casuar.
<i>Anakasia</i>	Aral.	<i>Cladogynos</i>	Euph.
<i>Annanas</i> *	Brom.	<i>Compositae</i>	Comp.
<i>Anogeissus</i> (As)	Combr.	<i>Coniferae</i> p.p.	Conif.
<i>Araceae</i>	Arac.	<i>Cyperaceae</i> p.p.	Cyp.
<i>Astrothalamus</i>	Urt.	<i>Daphne</i>	Thym.
<i>Caldcluvia</i> p.p.	Cun.	<i>Epiprinus</i>	Euph.
<i>Casuarina</i>	Casuar.	<i>Eriocaulon</i>	Erioc.
<i>Celosia</i>	Amaran.	<i>Eryngium</i> *	Umb.

(76. Inflorescence compact, continued)

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Freycinetia</i>	Pand.	<i>Pimelea</i>	Thym.
<i>Gomphrena</i>	Amaran.	<i>Pterisanthes</i>	Vit.
<i>Gramineae</i> p.p.	Gram.	<i>Ptilotus</i>	Amaran.
<i>Gymnostoma</i>	Casuar.	<i>Pullea</i> p.p.	Cun.
<i>Koiloclepa</i>	Euph.	<i>Rhodoleia</i>	Hamam.
<i>Leguminosae</i> p.p.	Leg.	<i>Rubiaceae</i> p.p.	Rub.
<i>Lepeostegia</i>	Loranth.	<i>Sararanga</i>	Pand.
<i>Lepidaria</i>	Loranth.	<i>Saurauia</i> p.p.	Actin.
<i>Lindera</i>	Laur.	<i>Schefflera</i> p.p.	Aral.
<i>Litsea</i>	Laur.	<i>Scyphostegia</i>	Scyph.
<i>Meryta</i> (P)	Aral.	<i>Sparganium</i>	Sparg.
<i>Moraceae</i>	Morac.	<i>Symingtonia</i>	Hamam.
<i>Myrtaceae</i> p.p.	Myrt.	<i>Typha</i>	Typh.
<i>Nypa</i>	Palm.	<i>Urticaceae</i> p.p.	Urt.
<i>Nyssa</i>	Nyss.	<i>Xyris</i>	Xyr.
<i>Pandanus</i>	Pand.		

77. Inflorescence a condensed raceme — Fig. 48

Basically a raceme but flowers very close together as in *Kopsia* and *Scyphostegia*.

<i>Taxon</i>	<i>Family</i>
<i>Embelia</i> p.p.	Myrsin.
<i>Euphorbiaceae</i> p.p.	Euph.
<i>Hoya</i> p.p.	Asclep.
<i>Kopsia</i> p.p.	Apoc.
<i>Rapanea</i> p.p.	Myrsin.
<i>Rubiaceae</i> p.p.	Rub.
<i>Sarawakodendron</i>	Celastr.
<i>Scyphostegia</i>	Scyph.

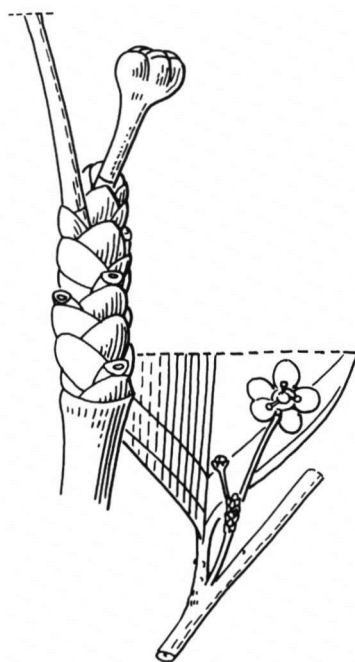


Figure 48. Inflorescence a condensed raceme — *Sarawakodendron filamentosum*.

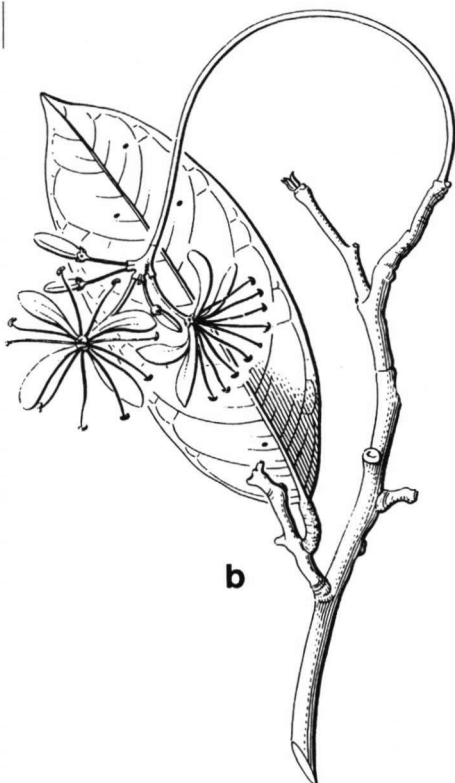


Figure 49. Flagelliflory – a. *Barringtonia scortechini*; b. *Quassia indica* (→).

78. Flagelliflory — Fig. 49

Inflorescence long and pendent, usually terminal, e.g. *Barringtonia* and *Parkia*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aglaia</i> p.p.	Meliac.	<i>Galearia</i>	Euph.
<i>Alpinia</i> p.p.	Zing.	<i>Ixora</i> p.p.	Rub.
<i>Antidesma</i> p.p.	Euph.	<i>Kigelia</i> *	Bign.
<i>Aphanamixis</i>	Meliac.	<i>Macadamia hildebrandii</i>	Prot.
<i>Arenga</i>	Palm.	<i>Meliosma</i> p.p.	Sab.
<i>Baccaurea</i> p.p.	Euph.	<i>Mucuna</i>	Leg.
<i>Barringtonia</i>	Lecyth.	<i>Musa</i> p.p.	Musac.
<i>Calamus</i> p.p.	Palm.	<i>Octomeles</i>	Datisc.
<i>Calyptrocalyx</i>	Palm.	<i>Parkia</i>	Leg.
<i>Carronia</i>	Menisp.	<i>Petalophus</i>	Annon.
<i>Chisocheton</i> p.p.	Meliac.	<i>Piper</i> p.p.	Piper.
<i>Cowiea</i>	Rub.	<i>Plectocomia</i>	Palm.
<i>Dendrocide</i>	Urt.	<i>Quassia indica</i>	Simar.
<i>Diospyros</i> p.p.	Eben.	<i>Strongylodon</i>	Leg.
<i>Diploclisia</i>	Menisp.	<i>Tinomiscium</i>	Menisp.
<i>Engelhardia</i>	Jugl.	<i>Toona</i>	Meliac.
<i>Eurycoma</i>	Simar.		
<i>Fahrenheitia</i> p.p.	Euph.		
<i>Fibraurea</i>	Menisp.		



FLOWER (characters 79–92)

79. 3-merous dicots

Most dicots are 5-merous, 3-merous flowers are a rule in some dicot families such as *Annonaceae*, *Lauraceae* and *Menispermaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Ailanthus</i> p.p.	Simar.	<i>Hernandiaceae</i> p.p.	Hern.
<i>Anisophyllea</i> p.p.	Rhiz.	<i>Icacinaeae</i> p.p.	Icacin.
<i>Annonaceae</i> p.p.	Annon.	<i>Kandelia</i> p.p.	Rhiz.
<i>Araliaceae</i> p.p.	Aral.	<i>Lauraceae</i>	Laur.
<i>Aristolochiaceae</i> p.p.	Arist.	<i>Loranthaceae</i> p.p.	Loranth.
<i>Balanophora</i> p.p.	Balanoph.	<i>Magnoliaceae</i> p.p.	Magn.
<i>Bennettiodendron</i> p.p.	Flac.	<i>Malaisia</i>	Morac.
<i>Berberidaceae</i> p.p.	Berb.	<i>Menispermaceae</i>	Menisp.
<i>Bouea</i> p.p.	Anac.	<i>Myristicaceae</i>	Myrist.
<i>Buxaceae</i> p.p.	Bux.	<i>Olacaceae</i> p.p.	Olacac.
<i>Campnosperma</i> p.p.	Anac.	<i>Onagraceae</i> p.p.	Onagr.
<i>Canarium</i> p.p.	Burs.	<i>Palaquium</i>	Sapot.
<i>Ceriops</i> p.p.	Rhiz.	<i>Piperaceae</i> p.p.	Piper.
<i>Cheilotheca</i> p.p.	Eric.	<i>Polygonaceae</i> p.p.	Polygon.
<i>Combretocarpus</i> p.p.	Rhiz.	<i>Quassia</i> p.p.	Simar.
<i>Cunoniaceae</i> p.p.	Cun.	<i>Ranunculaceae</i> p.p.	Ranunc.
<i>Dacryodes</i> p.p.	Burs.	<i>Salacia</i> p.p.	Celastr.
<i>Daphniphyllum</i> p.p.	Daphn.	<i>Santiria</i> p.p.	Burs.
<i>Diospyros</i> p.p.	Eben.	<i>Santalaceae</i> p.p.	Sant.
<i>Elatine</i> p.p.	Elat.	<i>Saururus</i> p.p.	Saur.
<i>Euphorbiaceae</i> p.p.	Euph.	<i>Scolopia</i> p.p.	Flac.
<i>Eurycoma</i> p.p.	Simar.	<i>Scyphostegia</i> p.p.	Scyph.
<i>Fagaceae</i> p.p.	Fagac.	<i>Sonerila</i>	Melast.
<i>Guttiferae</i> p.p.	Gutt.	<i>Soulamea</i> p.p.	Simar.
<i>Haplolobus</i> p.p.	Burs.	<i>Tetracera</i> p.p.	Dill.
<i>Hemiscolopia</i> p.p.	Flac.	<i>Winteraceae</i> p.p.	Wint.

80. Calyx accrescent — Fig. 50

Calyx increasing in size after anthesis, as, e.g., in *Diospyros* and many *Dipterocarpaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Actephila</i> p.p.	Euph.	<i>Clerodendrum</i>	Verb.
<i>Ancistrocladus</i>	Ancistr.	<i>Dimorphocalyx</i>	Euph.
<i>Antigonon</i> *	Polygon.	<i>Diospyros</i>	Eben.
<i>Ardisia</i> p.p.	Myrsin.	<i>Dipterocarpaceae</i>	Dipt.
<i>Blachia</i>	Euph.	<i>Drypetes</i> p.p.	Euph.
<i>Breynia</i>	Euph.	<i>Epiprinus</i>	Euph.
<i>Capparis</i> p.p.	Capp.	<i>Erismanthus</i> p.p.	Euph.

(80. Calyx accrescent, continued)

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Faradaya</i>	Verb.	<i>Parishia</i>	Anac.
<i>Garcinia</i>	Gutt.	<i>Petraeovitex</i>	Verb.
<i>Gluta</i> p.p.	Anac.	<i>Physalis</i>	Solan.
<i>Harmandia</i>	Olacac.	<i>Schoutenia</i>	Tiliac.
<i>Hernandia</i>	Hern.	<i>Swintonia</i>	Anac.
<i>Holmskioldia</i> *	Verb.	<i>Theaceae</i> p.p.	Theac.
<i>Hymenopyramis</i> (As)	Verb.	<i>Trigonostemon</i>	Euph.
<i>Koilodepas pectinata</i>	Euph.	<i>Vitex</i>	Verb.
<i>Lasiococca</i>	Euph.		

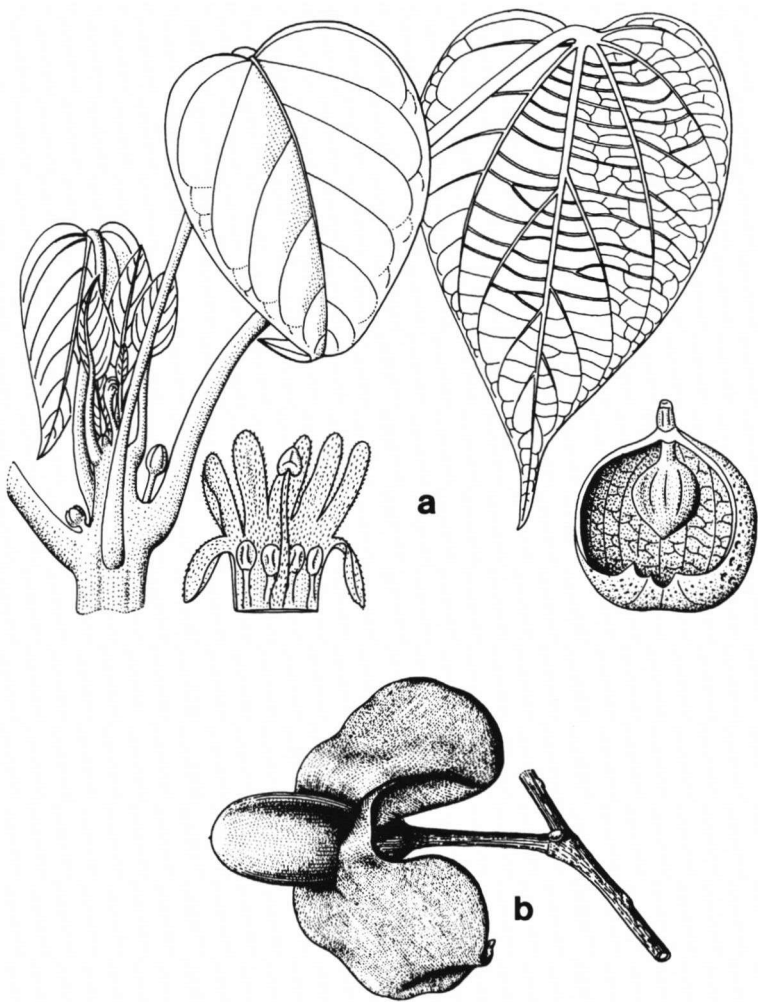


Figure 50. Calyx accrescent – a. *Hernandia ovigera*; b. *Harmandia mekongensis*.

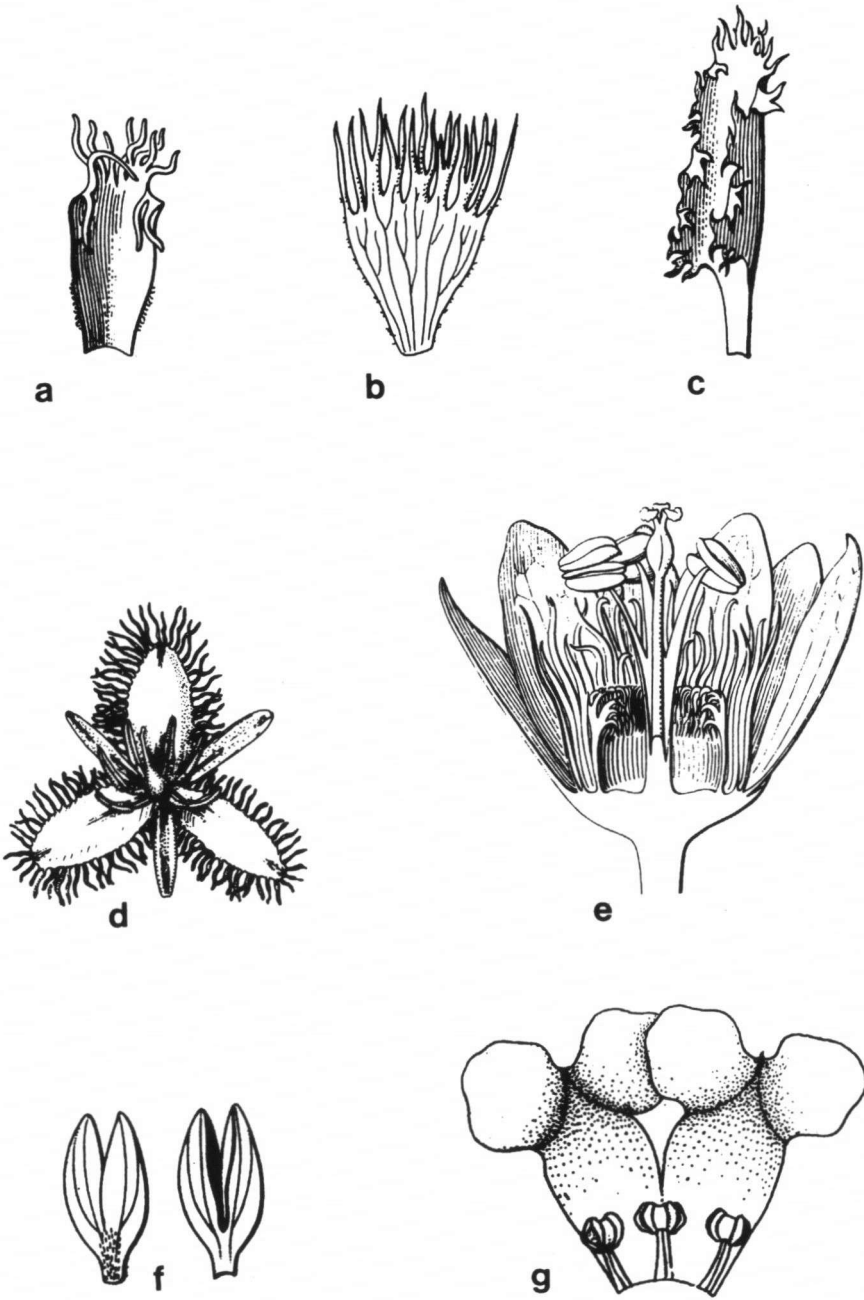


Figure 51. Corolla / petals fimbriate / bifid – a. *Ceriops tagal*; b. *Elaeocarpus stipularis*; c. *Carallia brachiata*; d. *Thysanotus tuberosus*; e. *Hollrungia aurantioides* (Passifl.); f. *Dichapetalum timoriense*; g. *Erycibe griffithii*.

81. Corolla / petals fimbriate / bifid — Fig. 51

Plants with corolla or petals finely dissected as in *Elaeocarpus* or deeply bifid as in *Dichapetalum*. The latter taxa are indicated by (2). In *Passifloraceae* it is the corona which is fimbriate.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aceratium</i> p.p.	Elaeoc.	<i>Ischnocarpus</i>	Apoc.
<i>Anisophyllea</i>	Rhiz.	<i>Kandelia</i>	Rhiz.
<i>Bruguiera</i>	Rhiz.	<i>Lophopetalum</i> p.p.	Celastr.
<i>Carallia</i>	Rhiz.	<i>Macaranga fimbriata</i> (Au)	Euph.
<i>Caryophyllaceae</i> (2)	Caryoph.	<i>Malpighia</i> p.p.*	Malp.
<i>Ceriops</i>	Rhiz.	<i>Nymphoides</i>	Gent.
<i>Cocculus orbiculatus</i>	Menisp.	<i>Ola</i> p.p.	Olacac.
<i>Crispiloba</i> (Au)	Alseu.	<i>Orchidaceae</i> p.p.	Orch.
<i>Dichapetalum</i> (2)	Dichap.	<i>Passifloraceae</i> (corona)	Passifl.
<i>Dolichandrone spathacea</i>	Bign.	<i>Rhizophora</i>	Rhiz.
<i>Dubouzetia</i> p.p.	Elaeoc.	<i>Scolopia</i> p.p.	Flac.
<i>Elaeocarpus</i>	Elaeoc.	<i>Sericolea</i> p.p. (2)	Elaeoc.
<i>Erycibe</i> (2)	Conv.	<i>Sloanea</i> p.p.	Elaeoc.
<i>Euonymus</i> p.p.	Celastr.	<i>Stereospermum fimbriatum</i>	Bign.
<i>Gesneriaceae</i> p.p.	Gesn.	<i>Thysanotus</i>	Liliac.
<i>Gynotroches</i>	Rhiz.	<i>Trichosanthes</i>	Cuc.
<i>Hiptage</i> p.p.	Malp.	<i>Trigonostemon diplopetalus</i> (2)	Euph.
<i>Hodgsonia</i>	Cuc.		

82. Corolla / petals with appendages — Fig. 52

Plants in which the corolla or petals bear appendages, as, e.g., in many *Apocynaceae* and *Flacourtiaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Adenia</i>	Passifl.	<i>Paropsia</i>	Flac.
<i>Apocynaceae</i> p.p.	Apoc.	<i>Passiflora</i>	Passifl.
<i>Boraginaceae</i> p.p.	Borag.	<i>Ryparosa</i>	Flac.
<i>Cuscuta</i>	Conv.	<i>Sabia</i>	Sab.
<i>Erythroxylon</i>	Erythr.	<i>Sapindaceae</i> p.p.	Sapind.
<i>Hydnocarpus</i>	Flac.	<i>Scaphocalyx</i>	Flac.
<i>Meliosma</i>	Sab.	<i>Thymelaeaceae</i> p.p.	Thym.
<i>Pangium</i>	Flac.	<i>Trichadenia</i>	Flac.

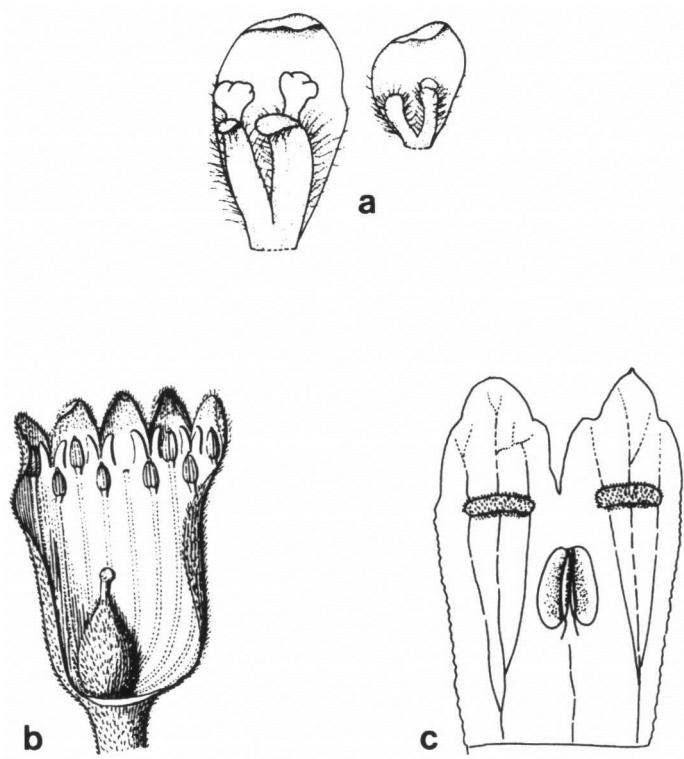


Figure 52. Corolla / petals with appendages – a. *Guioa pleuropterus* (Sapind.); b. *Enkleia malaccensis* (Thym.); c. *Cynoglossum javanicum* (Borag.).

83. Stamens opposite the petals

Plants in which the stamens are placed before the petals (e.g. *Rhamnaceae*) instead of alternating with them as is usually the case. Also plants where the stamens are opposite the tepals (petals absent).

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Amaranthaceae</i>	Amaran.	<i>Opiliaceae</i>	Opil.
<i>Basellaceae</i>	Basell.	<i>Papaveraceae</i>	Papav.
<i>Berberidaceae</i>	Berb.	<i>Phytolacca</i>	Phytol.
<i>Chenopodiaceae</i>	Chenop.	<i>Plumbaginaceae</i>	Plumb.
<i>Corynocarpus</i>	Coryn.	<i>Polygonaceae</i>	Polygon.
<i>Crypteroniaceae</i>	Crypter.	<i>Portulaccaceae</i>	Port.
<i>Diospyros</i>	Eben.	<i>Primulaceae</i>	Prim.
<i>Dipterocarpaceae</i>	Dipt.	<i>Proteaceae</i>	Prot.
<i>Euphorbiaceae</i>	Euph.	<i>Rhamnaceae</i>	Rhamn.
<i>Flacourtiaceae</i>	Flac.	<i>Rhizophoraceae</i>	Rhiz.
<i>Loranthaceae</i>	Loranth.	<i>Sabiaceae</i>	Sab.
<i>Lythraceae</i>	Lythr.	<i>Sapotaceae</i>	Sapot.
<i>Melastomataceae</i>	Melast.	<i>Sarcosperma</i>	Sarcosp.
<i>Menispermaceae</i>	Menisp.	<i>Sterculiaceae</i>	Sterc.
<i>Myrsinaceae</i>	Myrsin.	<i>Viscaceae</i>	Visc.
<i>Olacaceae</i>	Olacac.	<i>Vitaceae</i>	Vit.
<i>Onagraceae</i>	Onagr.		

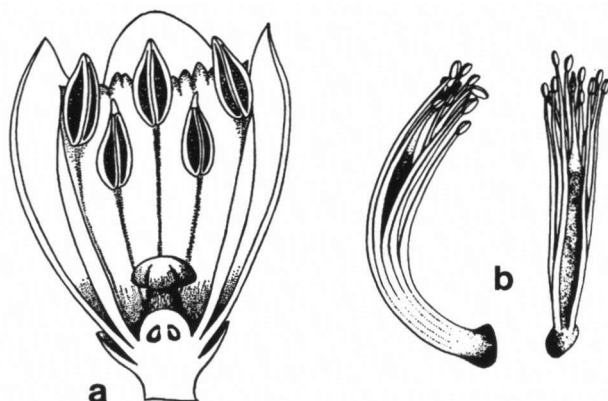


Figure 53. Staminal tube – a. *Reinwardtiadendron* (Meliac.); b. *Aeschynomene indica* (Legum.).

84. Staminal tube — Fig. 53

Stamens fused to form a tube, a very common feature of *Meliaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Bruinsmia</i>	Styr.	<i>Nyctaginaceae</i>	Nyctag.
<i>Camellia</i> p.p.	Theac.	<i>Oxalidaceae</i>	Oxal.
<i>Connaraceae</i> p.p.	Connar.	<i>Polygalaceae</i> p.p.	Polygal.
<i>Erythroxylon</i>	Erythr.	<i>Rutaceae</i> p.p.	Rut.
<i>Harmandia</i>	Olacac.	<i>Sterculiaceae</i> p.p.	Sterc.
<i>Leea</i>	Leeac.	<i>Styrax</i>	Styr.
<i>Leguminosae</i> p.p.	Leg.	<i>Symplocos</i> p.p.	Sympl.
<i>Linaceae</i>	Linac.	<i>Tiliaceae</i> p.p.	Tiliac.
<i>Malvaceae</i>	Malv.	<i>Trigoniasrum</i>	Trigon.
<i>Meliaceae</i> p.p.	Meliac.	<i>Violaceae</i> p.p.	Viol.
<i>Myrsinaceae</i> p.p.	Myrsin.		

85. Stamens with appendages — Fig. 54

Plants in which the stamens bear hair tufts or scales on filaments or anthers, as e.g. in *Ericaceae* and *Icacinaeae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Agatea</i>	Viol.	<i>Diplocyclos</i>	Cuc.
<i>Asclepiadaceae</i>	Asclep.	<i>Ecdysanthera</i>	Apoc.
<i>Cantleya</i>	Icac.	<i>Elaeocarpus</i>	Elaeoc.
<i>Celastraceae</i>	Celastr.	<i>Embolanthera</i>	Hamam.
<i>Chloranthus</i>	Chlor.	<i>Euphorbiaceae</i> p.p.	Euph.
<i>Cinnamomum</i>	Laur.	<i>Gaultheria</i>	Eric.
<i>Compositae</i> p.p.	Comp.	<i>Gomphandra</i>	Icac.
<i>Dillenia</i>	Dill.	<i>Harrisonia</i>	Simar.

(85. Stamens with appendages, continued)

Taxon	Family	Taxon	Family
<i>Helicia</i>	Prot.	<i>Polyalthia</i>	Annon.
<i>Hybanthus</i> p.p.	Viol.	<i>Premna</i>	Verb.
<i>Indigofera</i>	Leg.	<i>Rinorea</i>	Viol.
<i>Justicia</i>	Acanth.	<i>Rhyssopterys</i>	Malp.
<i>Leviera</i>	Monim.	<i>Stemona</i>	Stem.
<i>Macrolenes</i>	Melast.	<i>Stemonurus</i>	Icacin.
<i>Madhuca</i>	Sapot.	<i>Trichopus</i>	Diosc.
<i>Magnolia</i>	Magn.	<i>Typhonium</i>	Arac.
<i>Medusanthera</i>	Icac.	<i>Vaccinium</i>	Eric.
<i>Meliosma</i>	Sab.	<i>Viola</i>	Viol.
<i>Munronia</i>	Meliac.	<i>Zanthoxylum</i>	Rut.
<i>Parashorea</i>	Dipt.		

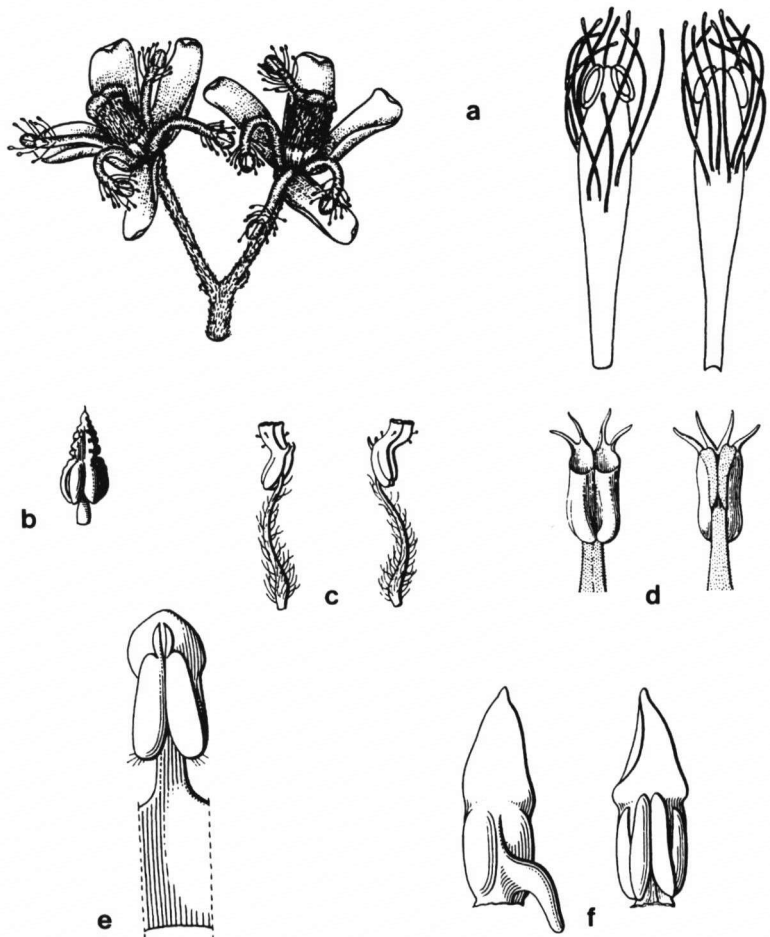


Figure 54. Stamens with appendages – a. *Gomphandra javanica*; b. *Kokoona ochracea* (Celastr.); c. *Vaccinium bancanum*; d. *Gaultheria punctata*; e. *Viola pilosa*; f. *Rinorea horneri*.

86. Anthers basifixed, apical pores — Fig. 55

The combination of basifixed anthers which open by apical pores is common in *Elaeocarpaceae* and *Ochnaceae*.

<i>Taxon</i>	<i>Family</i>
<i>Aceratium</i>	Elaeoc.
<i>Argostemma</i>	Rub.
<i>Cassia</i>	Leg.
<i>Clematis</i>	Ranunc.
<i>Dillenia</i>	Dill.
<i>Elaeocarpus</i>	Elaeoc.
<i>Ericaceae</i> p.p.	Eric.
<i>Euthemis</i>	Ochn.
<i>Gomphia</i>	Ochn.
<i>Melastomataceae</i> p.p.	Melast.
<i>Myrsinaceae</i> p.p.	Myrsin.
<i>Ochna</i>	Ochn.
<i>Pentaphylax</i>	Pentaph.
<i>Solanaceae</i> p.p.	Solan.
<i>Tetracera</i>	Dill.
<i>Theaceae</i> p.p.	Theac.
<i>Wrightia</i>	Apoc.

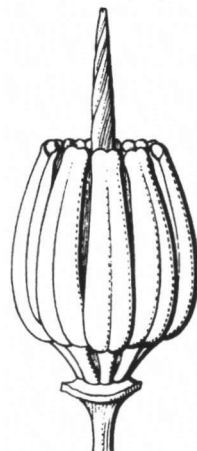


Figure 55. Anthers basifixed, apical pores — *Gomphia serrata*.



Figure 56. Anthers opening by valves — a. *Embolanthera spicata*; b. *Nothaphoebe umbelliflora*.

87. Anthers opening by valves — Fig. 56

Instead of opening by slits or pores the anthers open by one or more window-like structures; characteristic for *Lauraceae*.

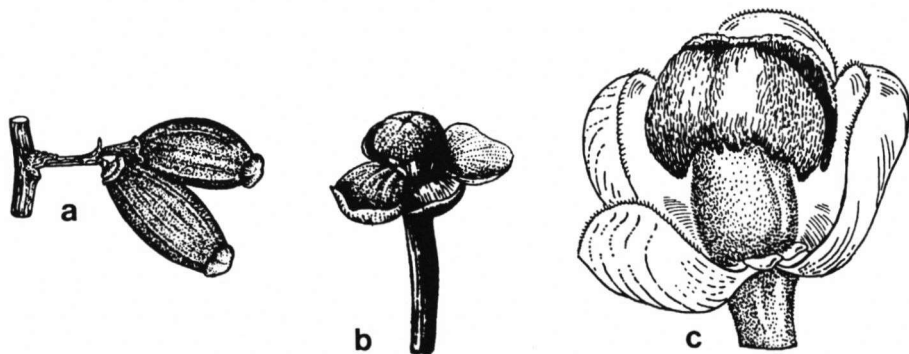
<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Actinodaphne</i>	Laur.	<i>Dryadodaphne</i>	Monim.
<i>Actinolindera</i>	Laur.	<i>Embolanthera</i>	Hamam.
<i>Alseodaphne</i>	Laur.	<i>Endiandra</i>	Laur.
<i>Beilschmiedia</i>	Laur.	<i>Eusideroxylon</i>	Laur.
<i>Caryodaphnopsis</i>	Laur.	<i>Gyrocarpus</i>	Hern.
<i>Cinnadenia</i>	Laur.	<i>Hernandia</i>	Hern.
<i>Cinnamomum</i>	Laur.	<i>Hexapora</i>	Laur.
<i>Cryptocarya</i>	Laur.	<i>Illigera</i>	Hern.
<i>Dehaasia</i>	Laur.	<i>Lindera</i>	Laur.

(87. Anthers opening by valves, continued)

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Litsea</i>	Laur.	<i>Polyporandra</i>	Icacin.
<i>Neocinnamomum</i>	Laur.	<i>Potoxylon</i>	Laur.
<i>Neolitsea</i>	Laur.	<i>Rhodoleia</i>	Hamam.
<i>Nothaphoebe</i>	Laur.	<i>Sycopsis</i>	Hamam.
<i>Persea</i>	Laur.	<i>Triadodaphne</i>	Laur.
<i>Phoebe</i>	Laur.		

88. Broad sessile stigma — Fig. 57The ovary bears a broad flat stigma as seen in *Garcinia*, *Ilex* and others.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aglaia</i> p.p.	Meliac.	<i>Iodes</i>	Icacin.
<i>Aphanamixis</i>	Meliac.	<i>Kokoona</i>	Celastr.
<i>Aporosa</i> p.p.	Euph.	<i>Medusanthera</i>	Icacin.
<i>Aquilaria</i>	Thym.	<i>Miquelia</i>	Icacin.
<i>Canarium</i> p.p.	Burs.	<i>Octospermum</i>	Euph.
<i>Cantleya</i>	Icacin.	<i>Platea</i>	Icacin.
<i>Champereia</i>	Opil.	<i>Polyporandra</i>	Icacin.
<i>Codiocarpus</i>	Icacin.	<i>Pseudoclausena</i>	Meliac.
<i>Dacryodes</i>	Burs.	<i>Pyrenacantha</i>	Icacin.
<i>Drypetes</i>	Euph.	<i>Rhyticaryum</i>	Icacin.
<i>Endospermum</i>	Euph.	<i>Ryparosa</i>	Flac.
<i>Erycibe</i>	Conv.	<i>Santiria</i>	Burs.
<i>Garcinia</i>	Gutt.	<i>Sphenostemon</i>	Sphen.
<i>Gomphandra</i>	Icacin.	<i>Trimenia</i>	Trim.
<i>Gonocaryum</i> p.p.	Icacin.	<i>Triomma</i>	Burs.
<i>Haplolobus</i>	Burs.	<i>Walsura</i>	Meliac.
<i>Hydnocarpus</i> p.p.	Flac.	<i>Wikstroemia</i>	Thym.
<i>Ilex</i>	Aquif.		

Figure 57. Broad sessile stigma — a. *Gomphandra javanica*; b. *Garcinia segmentata*; c. *Drypetes polyneura*.

89. Long forked style — Fig. 58

The style is divided to the base and the arms are divergent. Common in *Moraceae* and several *Euphorbiaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aporosa</i> p.p.	Euph.	<i>Nyssa</i>	Nyss.
<i>Araliaceae</i> p.p.	Aral.	<i>Polyosma</i>	Sax.
<i>Buxus</i>	Bux.	<i>Pteleocarpa</i>	Borag.
<i>Cunoniaceae</i>	Cun.	<i>Sapindaceae</i> p.p.	Sapind.
<i>Daphniphyllum</i>	Daphn.	<i>Sarcococca</i>	Bux.
<i>Euphorbiaceae</i> p.p.	Euph.	<i>Ulmaceae</i>	Ulm.
<i>Hamamelidaceae</i> p.p.	Hamam.	<i>Umbelliferae</i> p.p.	Umb.
<i>Itea</i>	Sax.	<i>Urticaceae</i> p.p.	Urt.
<i>Moraceae</i> p.p.	Morac.		



Figure 58. Long forked style – a. *Nyssa javanica*; b. *Celtis philippensis* (Ulm.).

90. Double forked style — Fig. 59

Like the previous but each arm of the style again divided, e.g. *Cordia*.

<i>Taxon</i>	<i>Family</i>
<i>Aporosa</i> p.p.	Euph.
<i>Celtis</i>	Ulm.
<i>Cleidion</i>	Euph.
<i>Cleistanthus</i> p.p.	Euph.
<i>Cordia</i>	Borag.
<i>Croton</i> p.p.	Euph.
<i>Gelsemium</i>	Logan.
<i>Pteleocarpa</i>	Borag.
<i>Rhamnus</i>	Rhamn.
<i>Wetria</i>	Euph.

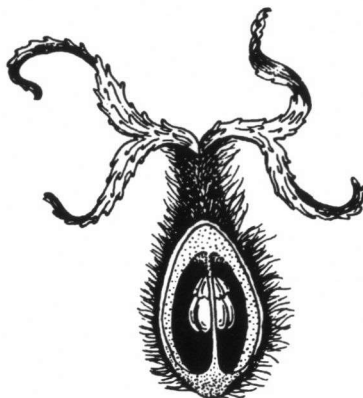


Figure 59. Double forked style – *Aporosa lagenocarpa*.

91. Excentric style— Fig. 60

Plants in which the style is not terminal but basal or marginal. Common in *Sapindaceae* and *Sabiaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Antidesma</i> p.p.	Euph.	<i>Menispermaceae</i> p.p.	Menisp.
<i>Apodytes</i>	Icacin.	<i>Ochnaceae</i>	Ochn.
<i>Chrysobalanaceae</i>	Chrysob.	<i>Pegia</i>	Anac.
<i>Commelinaceae</i> p.p.	Comm.	<i>Pimelea</i>	Thym.
<i>Dichondra</i>	Conv.	<i>Pleurostylia</i>	Celastr.
<i>Dracontomelon</i>	Anac.	<i>Ranunculaceae</i>	Ranunc.
<i>Ficus</i> p.p.	Morac.	<i>Sabia</i>	Sab.
<i>Finschia</i>	Prot.	<i>Santiria</i>	Burs.
<i>Gluta</i>	Anac.	<i>Sapindaceae</i> p.p.	Sapind.
<i>Helicia</i>	Prot.	<i>Spondias</i>	Anac.
<i>Labiatae</i>	Lab.	<i>Streblus</i>	Morac.
<i>Mangifera</i>	Anac.	<i>Suriana</i>	Simar.
<i>Meliosma</i>	Sab.		

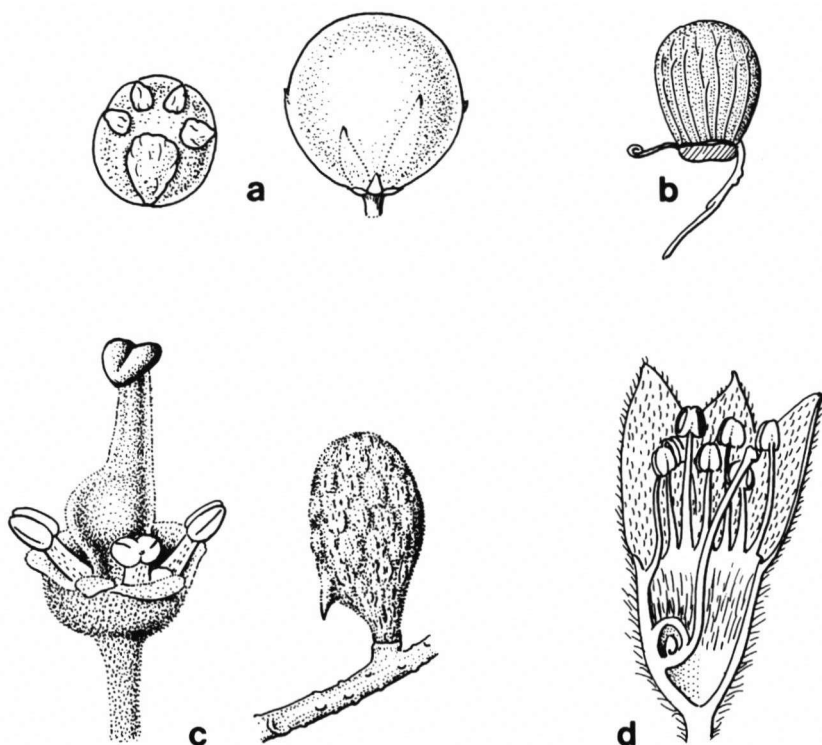


Figure 60. Excentric style — a. *Dracontomelon dao*; b. *Apodytes dimidiata*; c. *Nephelium maingayi* (Sapind.); d. *Parinari sumatrana* (Chrysob.).

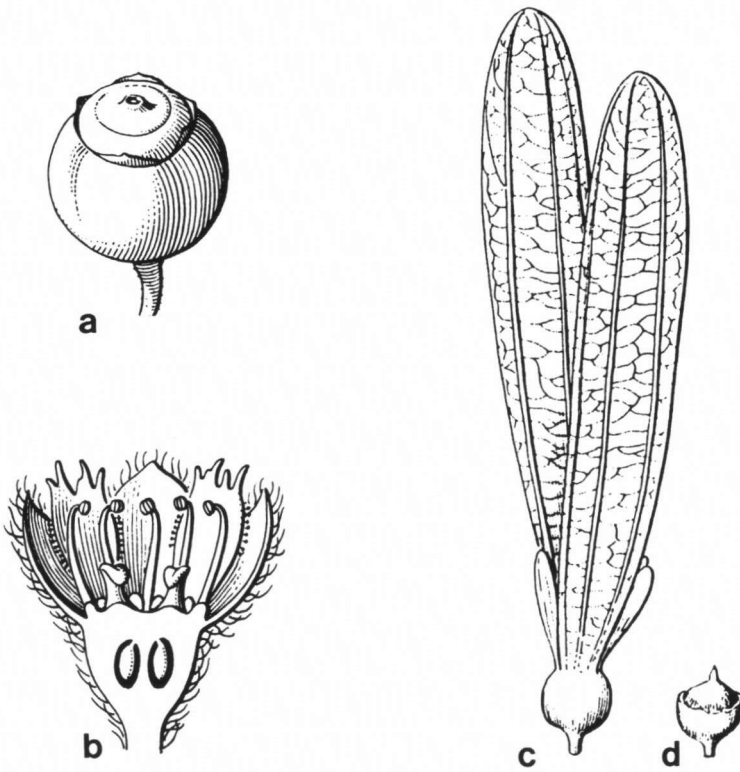


Figure 61. Ovary inferior – a. *Vaccinium bancanum*; b. *Anisophyllea disticha*; c. *Anisoptera grossivenia*; d. idem, wings removed.

92. Ovary inferior — Fig. 61

Ovary completely embedded in the hypanthium. Common in a few families such as *Rubiaceae* and *Caprifoliaceae*, exceptional in others such as *Dipterocarpaceae* and *Flacourtiaceae*. Taxa in which the ovary is incompletely inferior are indicated by (1).

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Agapetes</i>	Eric.	<i>Burmanniaceae</i>	Burm.
<i>Alangium</i>	Alang.	<i>Cactaceae</i> *	Cact.
<i>Amaryllidaceae</i>	Amaryll.	<i>Cannaceae</i> *	Cannac.
<i>Anisophyllea</i>	Rhiz.	<i>Caprifoliaceae</i>	Caprif.
<i>Anisoptera</i> (1)	Dipt.	<i>Carallia</i>	Rhiz.
<i>Anneslea</i>	Theac.	<i>Cassytha</i>	Laur.
<i>Araliaceae</i>	Aral.	<i>Ceriops</i> (1)	Rhiz.
<i>Aristolochiaceae</i>	Arist.	<i>Chloranthaceae</i>	Chlor.
<i>Balanophoraceae</i>	Balanoph.	<i>Codonopsis</i> (1)	Camp.
<i>Begoniaceae</i>	Begon.	<i>Combretocarpus</i>	Rhiz.
<i>Bruguiera</i>	Rhiz.	<i>Combretaceae</i>	Combr.

(92. Ovary inferior – continued)

Taxon	Family	Taxon	Family
<i>Compositae</i>	Comp.	<i>Myrtaceae</i> (not <i>Tristaniopsis</i>)	Myrt.
<i>Corsia</i>	Cors.	<i>Nymphaeaceae</i>	Nymph.
<i>Costera</i>	Eric.	<i>Nyssa</i>	Nyss.
<i>Cryptocarya</i>	Laur.	<i>Octomeles</i>	Datisc.
<i>Cucurbitaceae</i>	Cuc.	<i>Olacaceae</i> p.p.	Olacac.
<i>Dimorphanthera</i>	Eric.	<i>Onagraceae</i>	Onagr.
<i>Dipterocarpus</i>	Dipt.	<i>Orchidaceae</i>	Orch.
<i>Engelhardia</i>	Jugl.	<i>Pellacalix</i>	Rhiz.
<i>Eriobotrya</i>	Rosac.	<i>Pentaphragma</i>	Pentapr.
<i>Eupomatia</i>	Eupom.	<i>Photinia</i>	Rosac.
<i>Eusideroxylon</i>	Laur.	<i>Potoxylon</i>	Laur.
<i>Gardneria</i> (1)	Logan.	<i>Punica</i> *	Punic.
<i>Goodeniaceae</i>	Good.	<i>Pyrus</i>	Rosac.
<i>Gouania</i>	Rhamn.	<i>Raphiolepis</i>	Rosac.
<i>Haemodorum</i> (1)	Haemod.	<i>Rhizophora</i>	Rhiz.
<i>Haloragaceae</i>	Halor.	<i>Rosa</i> *	Rosac.
<i>Hamamelidaceae</i> (1)	Hamam.	<i>Rubiaceae</i> (not <i>Gaertnera</i>)	Rub.
<i>Hernandia</i>	Hern.	<i>Ruthiella</i>	Camp.
<i>Homalium</i> (1)	Flac.	<i>Santalaceae</i>	Sant.
<i>Kandelia</i>	Rhiz.	<i>Saxifragaceae</i> , some (1)	Sax.
<i>Laurentia</i> *	Camp.	<i>Sciaphila</i>	Triur.
<i>Lobelia</i>	Camp.	<i>Sphenoclea</i>	Sphenoc.
<i>Loranthaceae</i>	Loranth.	<i>Stylidium</i>	Styl.
<i>Lythraceae</i>	Lythr.	<i>Tetragonia</i> (1)	Aizoac.
<i>Maesa</i> (1)	Myrsin.	<i>Tetrameles</i>	Datisc.
<i>Malus</i> *	Rosac.	<i>Triplostegia</i>	Dips.
<i>Marantaceae</i>	Marant.	<i>Umbelliferae</i>	Umb.
<i>Mastixia</i>	Corn.	<i>Vaccinium</i>	Eric.
<i>Mastixiodendron</i> (1)	Rub.	<i>Valeriana</i>	Val.
<i>Melastomataceae</i>	Melast.	<i>Viscaceae</i>	Visc.
<i>Moraceae</i>	Morac.	<i>Wahlenbergia</i> (1)	Camp.
<i>Musaceae</i>	Musac.	<i>Zingiberaceae</i>	Zing.

FRUIT (characters 93–101)

93. Fruits blue

Fruits ripening blue are exceptional. Common in *Elaeocarpus* and *Symplocos*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Alyxia</i>	Apoc.	<i>Lasianthus</i> p.p.	Rub.
<i>Amaracarpus</i>	Rub.	<i>Lepiniopsis</i>	Apoc.
<i>Callicarpa</i> p.p.	Verb.	<i>Litsea</i> p.p.	Laur.
<i>Clidemia</i>	Melast.	<i>Mastixia</i>	Corn.
<i>Cryptocarya</i> p.p.	Laur.	<i>Memecylon</i> p.p.	Melast.
<i>Dianella</i>	Liliac.	<i>Nertera</i> p.p.	Rub.
<i>Dichroa</i>	Sax.	<i>Peliosanthes</i>	Liliac.
<i>Diplycosia</i>	Eric.	<i>Phoebe</i> p.p.	Laur.
<i>Disporum</i>	Liliac.	<i>Polia</i>	Comm.
<i>Elaeocarpus</i> p.p.	Elaeoc.	<i>Polygonum</i>	Polygon.
<i>Erythralium</i> (seed)	Olcac.	<i>Polyosma</i>	Sax.
<i>Euchresta</i>	Leg.	<i>Psychotria</i> p.p.	Rub.
<i>Eurya</i>	Theac.	<i>Rubia</i>	Rub.
<i>Harmandia</i>	Olcac.	<i>Santiria</i> p.p.	Burs.
<i>Helicia</i>	Prot.	<i>Saprosma</i> p.p.	Rub.
<i>Jasminum</i>	Oleac.	<i>Symplocos</i> p.p.	Sympl.
<i>Lantana</i> *	Verb.	<i>Vaccinium</i> p.p.	Eric.

94. Woody fruits, scattered seeds — Fig. 62

Plants with large woody fruits, containing many scattered seeds as in most *Hydnocarpus* and *Xanthophyllum* species.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aegle</i>	Rut.	<i>Merrillia</i>	Rut.
<i>Bertholletia</i> *	Lecyth.	<i>Pimelodendron macrocarpum</i>	Euph.
<i>Burkillanthus</i>	Rut.	<i>Porterandia</i>	Rub.
<i>Capparis</i>	Capp.	<i>Rothmannia</i>	Rub.
<i>Couroupita</i> *	Lecyth.	<i>Salacia</i> p.p.	Celastr.
<i>Crateva</i>	Capp.	<i>Scaphocalyx</i>	Flac.
<i>Crescentia</i> *	Bign.	<i>Siphonodon</i>	Celastr.
<i>Feronia (Limonia)</i>	Rut.	<i>Strychnos</i>	Logan.
<i>Gardenia</i>	Rub.	<i>Urnularia</i>	Apoc.
<i>Glennia</i>	Sapind.	<i>Voacanga</i>	Apoc.
<i>Hodgsonia</i>	Cuc.	<i>Willughbeia</i>	Apoc.
<i>Hydnocarpus</i>	Flac.	<i>Xanthophyllum</i> p.p.	Polygal.
<i>Melodinus</i>	Apoc.	<i>Xylocarpus</i>	Meliac.

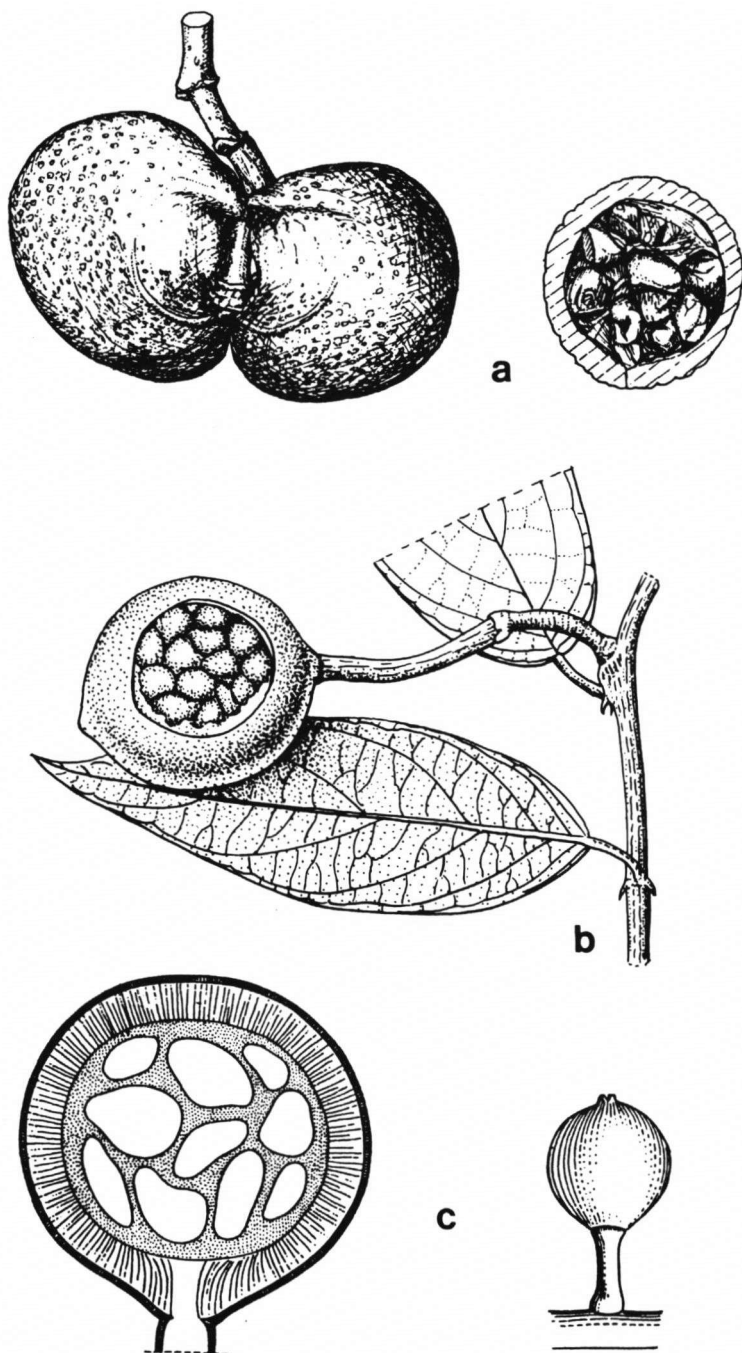


Figure 62. Woody fruits, scattered seeds – a. *Voacanga grandiflora*; b. *Capparis zeylanica*; c. *Hydnocarpus woodii*.

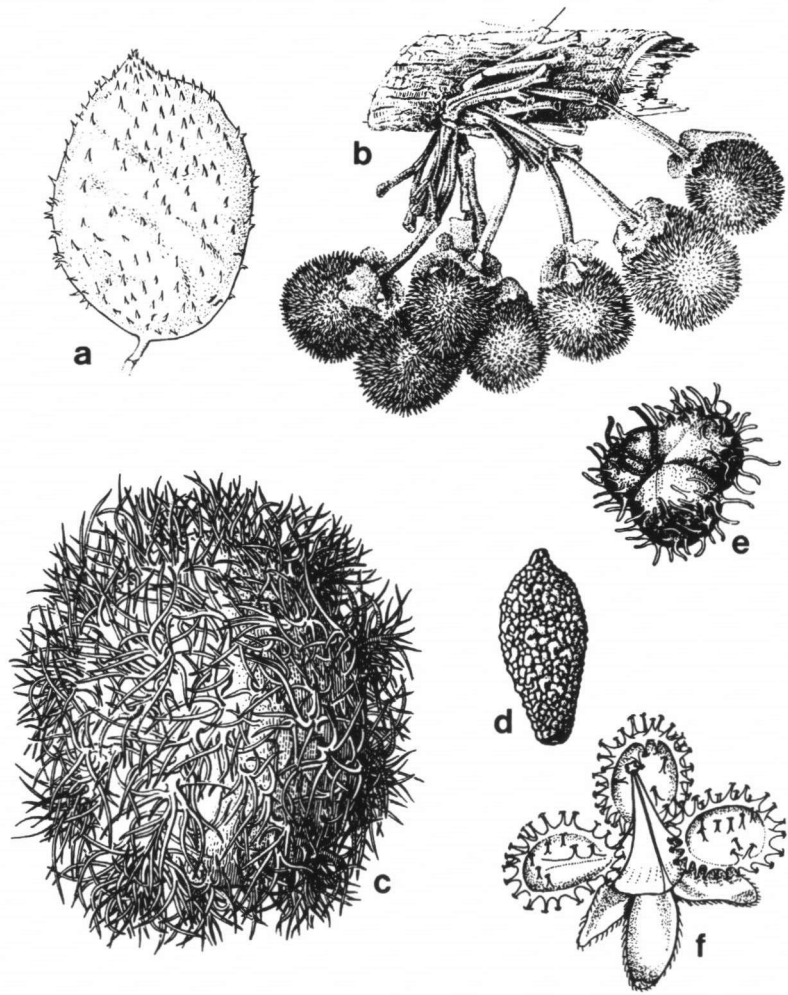


Figure 63. Spiny / muricate fruits – a. *Sindora velutina*; b. *Durio dulcis*; c. *Castanopsis hypophoenicia*; d. *Chilocarpus tuberculatus*; e. *Mallotus subpeltatus*; f. *Cynoglossum javanicum*.

95. Spiny / muricate fruits — Fig. 63

Fruits provided with soft processes such as *Nephelium*, stiff spiny ones such as *Castanopsis* or with a rugose surface such as *Parinari* or *Xerospermum*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acaena</i>	Rosac.	<i>Ambrosia</i> p.p.	Comp.
<i>Acanthospermum</i>	Comp.	<i>Amomum</i> p.p.	Zing.
<i>Agrimonia</i>	Rosac.	<i>Annona</i> p.p. *	Annon.
<i>Allamanda</i> *	Apoc.	<i>Artocarpus</i>	Morac.
<i>Amaranthaceae</i> p.p.	Amaran.	<i>Asterostemma</i>	Asclep.

(95. Spiny / muricate fruits, continued)

Taxon	Family	Taxon	Family
<i>Bidens</i>	Comp.	<i>Martynia</i> *	Pedal.
<i>Bixa</i> *	Bixac.	<i>Melanochyla</i> p.p.	Anac.
<i>Boraginaceae</i> p.p.	Borag.	<i>Melastoma beccarianum</i>	Melast.
<i>Byttneria</i>	Sterc.	<i>Microdesmis</i>	Euph.
<i>Caesalpinia</i> p.p.	Leg.	<i>Mimosa</i> *	Leg.
<i>Caldesia</i> p.p.	Alism.	<i>Momordica</i> p.p.	Cuc.
<i>Castanopsis</i>	Fagac.	<i>Monocarpia</i> p.p.	Annon.
<i>Cephalomappa</i>	Euph.	<i>Muellerargia</i>	Cuc.
<i>Ceratophyllum</i>	Cerat.	<i>Myrica</i>	Myric.
<i>Ceuthostoma</i>	Casuar.	<i>Neesia</i>	Bomb.
<i>Chaetocarpus</i>	Euph.	<i>Nephelium</i>	Sapind.
<i>Chilocarpus tuberculatus</i>	Apoc.	<i>Omphalodes</i> p.p.	Borag.
<i>Chionanthus pluriflorus</i>	Oleac.	<i>Opuntia</i> *	Cact.
<i>Chlaenandra</i>	Menisp.	<i>Ormocarpum</i>	Leg.
<i>Clappertonia</i> *	Tiliac.	<i>Pandanus</i>	Pand.
<i>Coelostegia</i>	Bomb.	<i>Parabaena</i>	Menisp.
<i>Commersonia</i>	Sterc.	<i>Paranephelium</i>	Sapind.
<i>Corchorus</i>	Tiliac.	<i>Parartocarpus</i>	Morac.
<i>Cosmos</i> p.p.	Comp.	<i>Pimelodendron macrocarpum</i>	Euph.
<i>Cubilia</i>	Sapind.	<i>Praravinia verruculosa</i>	Rub.
<i>Cullenia</i>	Bomb.	<i>Priva</i> *	Verb.
<i>Cyanandrium</i>	Melast.	<i>Pseuduvaria</i>	Annon.
<i>Cynanchum</i>	Asclep.	<i>Pternandra</i>	Melast.
<i>Cynoglossum</i>	Borag.	<i>Ptychopyxis caput-medusae</i>	Euph.
<i>Cyclanthera</i>	Cuc.	<i>Ranunculus</i>	Ranunc.
<i>Delphyodon</i>	Apoc.	<i>Ricinus</i> p.p.	Euph.
<i>Dichapetalum</i> p.p.	Dichap.	<i>Rinorea anguifera</i>	Viol.
<i>Dimocarpus</i> p.p.	Sapind.	<i>Sagittaria</i> p.p.	Alism.
<i>Dimorphocalyx muricatus</i>	Euph.	<i>Salomonina</i>	Polygal.
<i>Durio</i>	Bomb.	<i>Sanicula</i>	Umb.
<i>Ecballium</i>	Cuc.	<i>Schleichera</i>	Sapind.
<i>Erythrospermum</i>	Flac.	<i>Schrankia</i>	Leg.
<i>Euonymus</i> p.p.	Celastr.	<i>Sebastiania</i> p.p.	Euph.
<i>Fittingia</i> p.p.	Myrsin.	<i>Sida</i> p.p.	Malv.
<i>Flindersia</i>	Rut.	<i>Sindora</i> p.p.	Leg.
<i>Freycinetia</i>	Pand.	<i>Sloanea</i> p.p.	Elaeoc.
<i>Glossogyne</i>	Comp.	<i>Spathiostemon</i>	Euph.
<i>Gomphocarpus</i> *	Asclep.	<i>Taxillus</i>	Loranth.
<i>Gramineae</i> p.p.	Gram.	<i>Trapa</i>	Trap.
<i>Hydnocarpus polypetala</i>	Flac.	<i>Tribulus</i>	Zygoph.
<i>Jarandersonia</i>	Tiliac.	<i>Trichosanthes</i> p.p.	Cuc.
<i>Josephinia</i>	Pedal.	<i>Triumfetta</i>	Tiliac.
<i>Kostermansia</i>	Bomb.	<i>Umbelliferae</i> p.p.	Umb.
<i>Lasiococca</i>	Euph.	<i>Uncinia</i>	Cyp.
<i>Litchi</i>	Sapind.	<i>Urena</i>	Malv.
<i>Lithocarpus</i>	Fagac.	<i>Xanthium</i> p.p.	Comp.
<i>Macaranga</i> p.p.	Euph.	<i>Xerospermum</i> p.p.	Sapind.
<i>Macrolenes</i>	Melast.	<i>Zippelia</i>	Piper.
<i>Mallotus</i> p.p.	Euph.	<i>Zornia</i>	Leg.

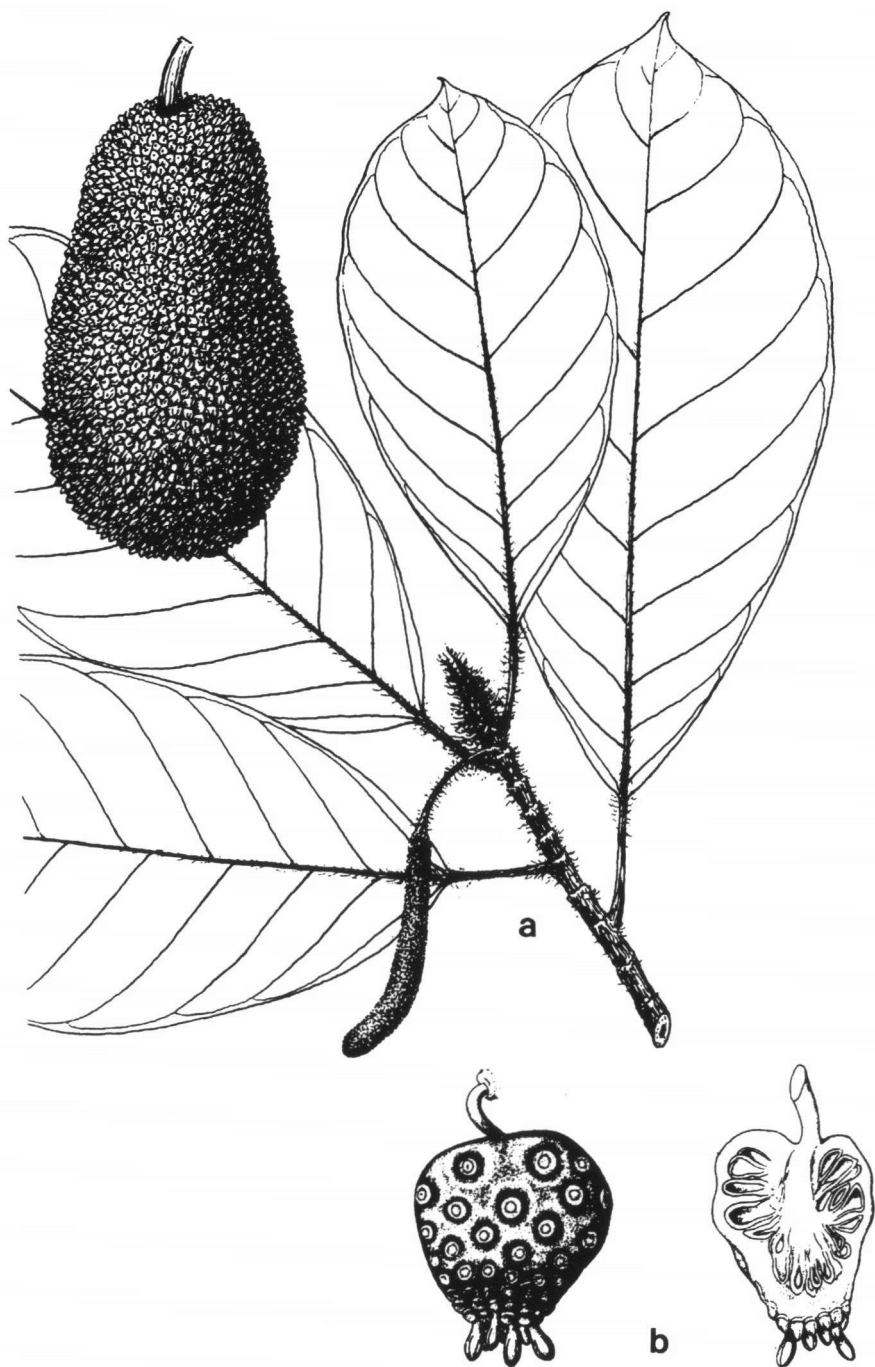


Figure 64. Compound fruits – a. *Artocarpus integer*; b. *Morinda citrifolia*.

96. Compound fruits — Fig. 64

Several fruits connate into a single structure as exemplified by *Artocarpus*, *Rubus* and *Nauclea*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Adina</i>	Rub.	<i>Maclura</i>	Morac.
<i>Agathis</i>	Arauc.	<i>Malaisia</i>	Morac.
<i>Altingia</i>	Hamam.	<i>Maoutia</i>	Urt.
<i>Anakasia</i>	Aral.	<i>Meryta</i> (P)	Aral.
<i>Annanas</i> *	Brom.	<i>Metadina</i>	Rub.
<i>Annona</i> *	Annon.	<i>Morinda</i>	Rub.
<i>Anthocephalus</i>	Rub.	<i>Morus</i>	Morac.
<i>Antiaris</i>	Morac.	<i>Nauclea</i>	Rub.
<i>Antiaropsis</i>	Morac.	<i>Osmoxylon</i>	Aral.
<i>Araceae</i>	Arac.	<i>Pandanus</i>	Pand.
<i>Araucaria</i>	Arauc.	<i>Parartocarpus</i>	Morac.
<i>Artocarpus</i>	Morac.	<i>Peperomia</i>	Piper.
<i>Astrothalamus</i>	Urt.	<i>Phytocrene</i>	Icacin.
<i>Banksia</i>	Prot.	<i>Pinus</i>	Conif.
<i>Broussonetia</i>	Morac.	<i>Piper</i>	Piper.
<i>Casuarina</i>	Casuar.	<i>Poikilospermum</i>	Urt.
<i>Ceuthostoma</i>	Casuar.	<i>Potentilla</i>	Rosac.
<i>Coelospermum</i>	Rub.	<i>Pothomorphe</i> *	Piper.
<i>Cunoniaceae</i> p.p.	Cun.	<i>Prairiea</i>	Morac.
<i>Dendrocnide</i>	Urt.	<i>Procris</i>	Urt.
<i>Elatostema</i>	Urt.	<i>Rennellia</i>	Rub.
<i>Etlingera</i>	Zing.	<i>Rhodoleia</i>	Hamam.
<i>Ficus</i>	Morac.	<i>Rollinia</i> *	Annon.
<i>Freycinetia</i>	Pand.	<i>Rubus</i>	Rosac.
<i>Gymnostoma</i>	Casuar.	<i>Sararanga</i>	Pand.
<i>Hullettia</i>	Morac.	<i>Schefflera</i> p.p.	Aral.
<i>Kadsura</i>	Schis.	<i>Schisandra</i>	Schis.
<i>Kibara</i>	Monim.	<i>Streblus</i> p.p.	Morac.
<i>Leucosyke</i>	Urt.	<i>Zingiberaceae</i> p.p.	Zing.

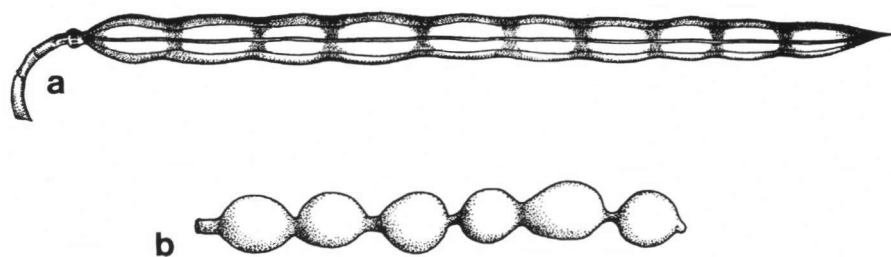


Figure 65. Moniliform fruit – a. *Moringa oleifera*; b. *Chilocarpus conspicuus*.

97. Moniliform fruit — Fig. 65

A usually elongated fruit constricted at intervals and giving the fruit the appearance of a string of beads, e.g. *Sophora*, *Alyxia*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acacia</i> p.p.	Leg.	<i>Neokeithia</i>	Apoc.
<i>Airyantha</i>	Leg.	<i>Ormocarpum</i>	Leg.
<i>Alyxia</i> p.p.	Apoc.	<i>Orophea</i>	Annon.
<i>Chilocarpus</i>	Apoc.	<i>Parameria</i>	Apoc.
<i>Cleghornia</i>	Apoc.	<i>Parkinsonia</i> *	Leg.
<i>Dasymaschalon</i>	Annon.	<i>Pottsia</i>	Apoc.
<i>Derris</i> p.p.	Leg.	<i>Rauwenhoffia</i>	Annon.
<i>Desmodium</i> p.p.	Leg.	<i>Rhodomyrtus</i> p.p.	Myrt.
<i>Desmos</i>	Annon.	<i>Sophora</i>	Leg.
<i>Erythrina</i> p.p.	Leg.	<i>Tamarindus</i>	Leg.
<i>Friesodielsia</i> p.p.	Annon.	<i>Urceola</i>	Apoc.
<i>Hollarrhena</i>	Apoc.	<i>Xylopia</i> p.p.	Annon.
<i>Moringa</i> *	Moring.		

98. Fruit winged — Fig. 66 (see also Fig. 32, p. 74)

Fruits provided by flat structures of different origin: in *Dipterocarpaceae* the wings are formed by accrescent calyx lobes, in *Engelhardia* the wings are formed by bracts, in *Combretum* the fruit is provided with thin ridges and in *Pterocarpus* the fruit is flat.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acer</i>	Acer.	<i>Baccaurea angulata</i>	Euph.
<i>Ailanthus</i>	Simar.	<i>Bauhinia scandens</i>	Leg.
<i>Ancistrocladus</i>	Ancistr.	<i>Begonia</i>	Begon.
<i>Anisoptera</i>	Dipt.	<i>Berrya</i>	Tiliac.
<i>Argyrodendron</i> (Au)	Sterc.	<i>Brachylophon</i>	Malp.
<i>Aspidopteris</i>	Malp.	<i>Butea</i>	Leg.
<i>Atalaya</i>	Sapind.	<i>Callitriche</i>	Callitr.

(98. Fruit winged, continued)

Taxon	Family	Taxon	Family
<i>Calycopteris</i>	Combr.	<i>Derris</i>	Leg.
<i>Cardiopteris</i>	Card.	<i>Dioscorea</i>	Diosc.
<i>Ceratopetalum virchowii</i> (Au)	Cun.	<i>Dipterocarpus</i>	Dipt.
<i>Colona</i>	Tiliac.	<i>Dodonaea</i>	Sapind.
<i>Combretocarpus</i>	Rhiz.	<i>Dryobalanops</i>	Dipt.
<i>Combretodendron</i>	Lecyth.	<i>Engelhardia</i>	Jugl.
<i>Combretum</i>	Combr.	<i>Erythrina</i> p.p.	Leg.
<i>Congea</i>	Verb.	<i>Firmiana</i>	Sterc.
<i>Corylelobium</i>	Dipt.	<i>Fraxinus</i>	Oleac.
<i>Dalbergia</i>	Leg.	<i>Gillbeea</i>	Cun.

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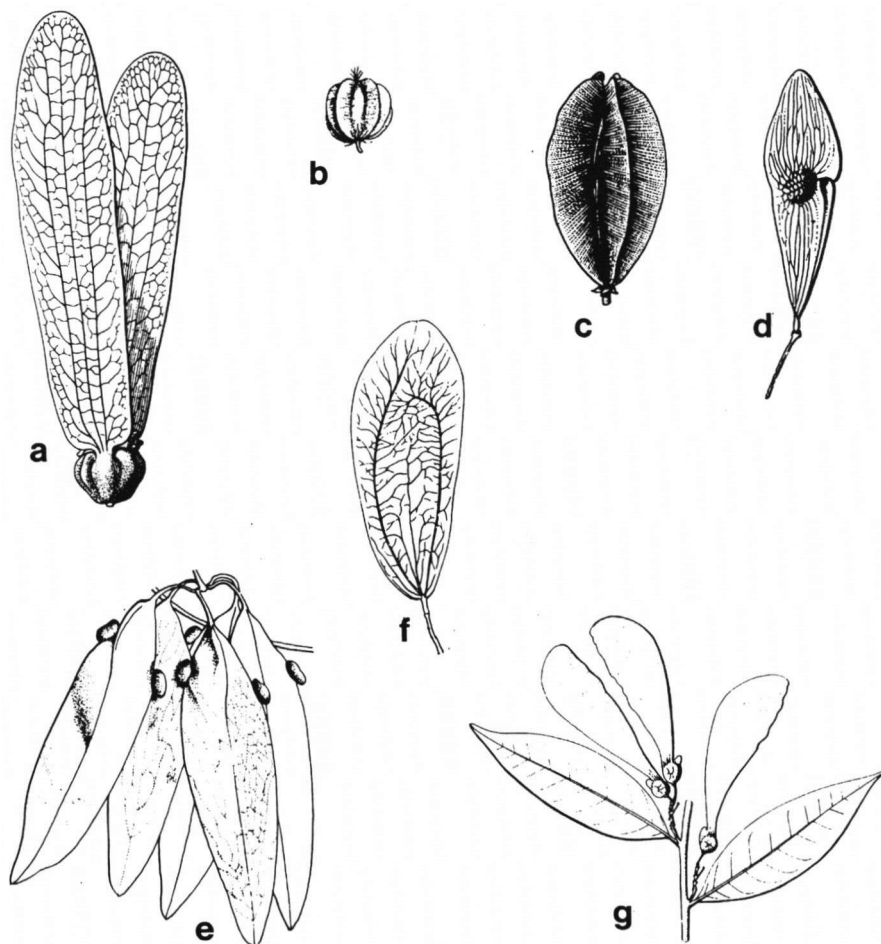


Figure 66. Fruit winged – a. *Dipterocarpus cornutus*; b. *Pentace excelsa*; c. *Lophopyxis maingayi*; d. *Ailanthus excelsa*; e. *Firmiana malayana*; f. *Koopassia malaccensis*; g. *Securidaca ecristata*.

(98. Fruit winged, continued)

Taxon	Family	Taxon	Family
<i>Glochidion</i> p.p.	Euph.	<i>Plagiopteron</i> (As)	Plag.
<i>Gluta</i> p.p.	Anac.	<i>Porana</i>	Conv.
<i>Gouania</i>	Rhamn.	<i>Pteleocarpa</i>	Borag.
<i>Guioa</i>	Sapind.	<i>Pterocarpus</i>	Leg.
<i>Gyrocarpus</i>	Hern.	<i>Pterococcus</i>	Euph.
<i>Harmandia</i>	Olacac.	<i>Pterocymbium</i>	Sterc.
<i>Hedyotis pterita</i>	Rub.	<i>Pterolobium</i>	Leg.
<i>Heritiera</i> p.p.	Sterc.	<i>Quisqualis</i>	Combr.
<i>Hernandia</i> p.p.	Hern.	<i>Rhyssopterys</i>	Malp.
<i>Hildegardia</i>	Sterc.	<i>Samadera</i>	Simar.
<i>Hiptage</i>	Malp.	<i>Sarcopteryx</i>	Sapind.
<i>Hopea</i>	Dipt.	<i>Scaphium</i>	Sterc.
<i>Hugonia</i>	Linac.	<i>Schoutenia</i>	iliac.
<i>Hymenocardia</i>	Euph.	<i>Securidaca</i>	Polygal.
<i>Illigera</i>	Hern.	<i>Shorea</i>	Dipt.
<i>Jackiopsis</i>	Rub.	<i>Smythea</i>	Rhamn.
<i>Kalappia</i>	Leg.	<i>Soulamea</i>	Simar.
<i>Kleinhovia</i>	Sterc.	<i>Spatholobus</i>	Leg.
<i>Koompassia</i>	Leg.	<i>Sphenodesme</i>	Verb.
<i>Kydia</i> (As)	Malv.	<i>Steenisia</i>	Rub.
<i>Lophopyxis</i>	Loph.	<i>Stenomeris</i>	Diosc.
<i>Macaranga</i> p.p.	Euph.	<i>Sterculia laurifolia</i> (Au)	Sterc.
<i>Macropteranthes</i> (Au)	Combr.	<i>Storckiella</i> (Au P)	Leg.
<i>Mallotus sumatranus</i>	Euph.	<i>Swintonia</i>	Anac.
<i>Marsdenia</i> p.p.	Asclep.	<i>Symphorema</i>	Verb.
<i>Maxwellia</i> (P)	Sterc.	<i>Terminalia</i> p.p.	Combr.
<i>Megistostigma burmannicum</i>	Euph.	<i>Tetractomia</i>	Rut.
<i>Myriopteron</i>	Asclep.	<i>Trigoniastrum</i>	Trigon.
<i>Neobalanocarpus</i>	Dipt.	<i>Triomma</i>	Burs.
<i>Neuropeltis</i>	Conv.	<i>Tripterygium</i> (As)	Celastr.
<i>Neuropeltopsis</i>	Conv.	<i>Tristellateia</i>	Malp.
<i>Pajanelia</i>	Bign.	<i>Tristira</i>	Sapind.
<i>Parashorea</i>	Dipt.	<i>Ulmus</i>	Ulm.
<i>Parishia</i>	Anac.	<i>Ungeria</i> (P)	Sterc.
<i>Pentace</i>	Tiliac.	<i>Upuna</i>	Dipt.
<i>Peripterygia</i> (P)	Celastr.	<i>Vatica</i> p.p.	Dipt.
<i>Petraeovitex</i>	Verb.	<i>Ventilago</i>	Rhamn.
<i>Petrea</i> *	Verb.	<i>Zollingeria</i>	Sapind.

99. Fruit ridged — Fig. 67

Fruits provided with (usually longitudinal) ridges; when very conspicuously raised they are considered winged fruits. Example of ridged fruits: *Helicia*, *Myristicaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Alangium</i> p.p.	Alang.	<i>Gonocaryum</i> p.p.	Icacin.
<i>Allantospermum</i>	Simar.	<i>Helicia</i> p.p.	Prot.
<i>Annonaceae</i> p.p.	Annon.	<i>Hernandia</i> p.p.	Hern.
<i>Apodytes</i>	Icacin.	<i>Leguminosae</i> p.p.	Leg.
<i>Baccaurea trigonocarpa</i>	Euph.	<i>Macadamia</i>	Prot.
<i>Barringtonia</i> p.p.	Lecyth.	<i>Mallotus</i> p.p.	Euph.
<i>Boerhavia</i>	Nyctag.	<i>Manihot esculenta</i> *	Euph.
<i>Burseraceae</i> p.p.	Burs.	<i>Meliosma</i>	Sab.
<i>Campanulaceae</i> p.p.	Camp.	<i>Myristicaceae</i> p.p.	Myrist.
<i>Casearia</i> p.p.	Flac.	<i>Pentastemona</i>	Pent.
<i>Chionanthus</i> p.p.	Oleac.	<i>Phytocrene</i> p.p.	Icacin.
<i>Connaraceae</i> p.p.	Connar.	<i>Psychotria</i>	Rub.
<i>Cryptocarya</i> p.p.	Laur.	<i>Ptychopyxis costata</i>	Euph.
<i>Dichapetalum</i> p.p.	Dichap.	<i>Quassia</i> p.p.	Simar.
<i>Dregea</i>	Asclep.	<i>Scyphostegia</i>	Scyph.
<i>Dysoxylum caulostachyum</i>	Meliac.	<i>Sterculiaceae</i> p.p.	Sterc.
<i>Euphorbiaceae</i> p.p.	Euph.	<i>Terminalia</i> p.p.	Combr.
<i>Finlaysonia</i>	Asclep.	<i>Teijsmanniodendron</i> p.p.	Verb.
<i>Garcinia</i> p.p.	Gutt.	<i>Thevetia</i> *	Apoc.
<i>Gomphandra</i> p.p.	Icacin.	<i>Timonius</i> p.p.	Rub.

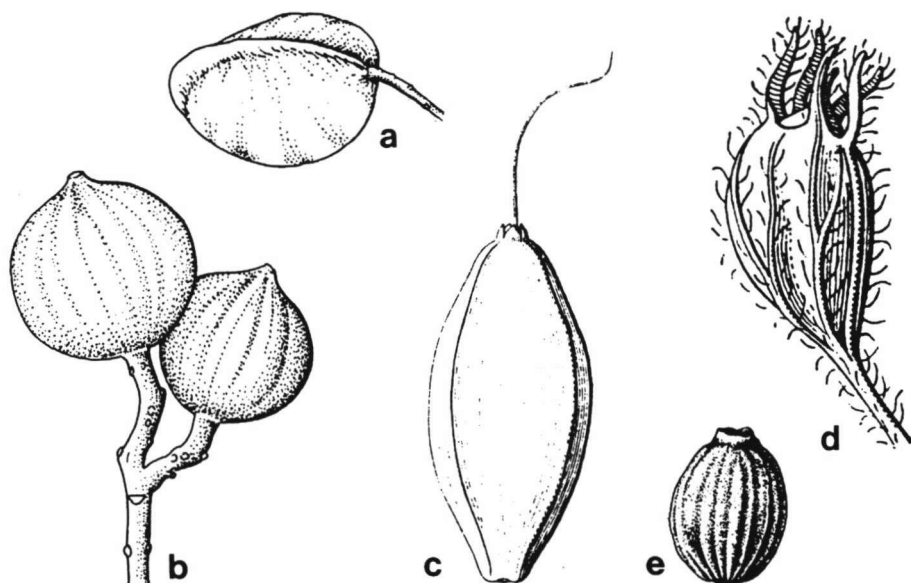


Figure 67. Fruit ridged — a. *Heritiera littoralis* (Sterc.); b. *Cryptocarya densiflora*; c. *Barringtonia macrostachys*; d. *Ruthiella saxicola* (Camp.); e. *Alangium ridleyi*.

100. Lagerstroemia capsule — Fig. 68

A more or less round capsule splitting at the top as in *Lagerstroemia*, *Metrosideros* and *Schima*.

Taxon

Axinandra
Coelostegia
Cratoxylum
Crypteronia
Dactylocladus
Distylium
Duabanga
Dubouzetia
Gordonia
Ixonanthes
Lagerstroemia
Leptospermum
Maingaya
Metrosideros
Neesia
Rhodoleia
Schima
Sloanea
Sycopsis
Tristaniopsis
Xanthostemon

Family

Crypter.
 Bomb.
 Gutt.
 Crypter.
 Crypter.
 Hamam.
 Sonn.
 Elaeoc.
 Theac.
 Linac.
 Lythr.
 Myrt.
 Hamam.
 Myrt.
 Bomb.
 Hamam.
 Theac.
 Elaeoc.
 Hamam.
 Myrt.
 Myrt.

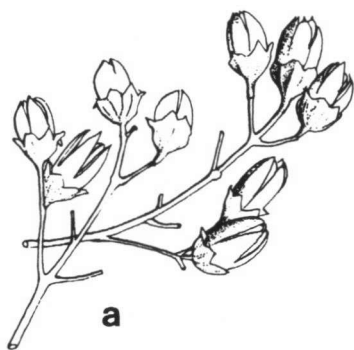


Figure 68. Lagerstroemia capsule — a. *Lagerstroemia floribunda*; b. *Gordonia grandiflora*.

101. Three-locular capsule — Fig. 69 (see also Fig. 63e, p. 124)

Most *Euphorbiaceae* have this type of fruit, but it is known in several other families, such as *Theaceae* and *Celastraceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acalypha</i>	Euph.	<i>Chondrostylis</i>	Euph.
<i>Actephila</i>	Euph.	<i>Cladogynos</i>	Euph.
<i>Agatea</i>	Viol.	<i>Claoxylon</i> p.p.	Euph.
<i>Agrostistachys</i>	Euph.	<i>Cleidion</i> p.p.	Euph.
<i>Alchornea</i>	Euph.	<i>Cleistanthus</i>	Euph.
<i>Allantospermum</i>	Simar.	<i>Cnesmone</i> p.p.	Euph.
<i>Amaryllidaceae</i>	Amaryll.	<i>Colubrina</i>	Rhamn.
<i>Amesiodendron</i> p.p.	Sapind.	<i>Croton</i> p.p.	Euph.
<i>Aporosa</i> p.p.	Euph.	<i>Dichapetalum</i>	Dichap.
<i>Arthropodium</i>	Liliac.	<i>Dicoelia</i>	Euph.
<i>Asthonina</i>	Euph.	<i>Dimorphocalyx</i>	Euph.
<i>Austrobuxus</i>	Euph.	<i>Elateriospermum</i>	Euph.
<i>Baccaurea</i> p.p.	Euph.	<i>Emmenosperma</i>	Rhamn.
<i>Blachia</i>	Euph.	<i>Epiprinus</i>	Euph.
<i>Blumeodendron</i> p.p.	Euph.	<i>Erismanthus</i>	Euph.
<i>Boesenbergia</i>	Zing.	<i>Erythrospermum</i>	Flac.
<i>Botryophora</i>	Euph.	<i>Euphorbia</i>	Euph.
<i>Brachyichilum</i>	Zing.	<i>Excoecaria</i>	Euph.
<i>Breynia</i>	Euph.	<i>Fahrenheitia</i>	Euph.
<i>Caesia</i>	Liliac.	<i>Flueggea</i>	Euph.
<i>Camellia</i>	Theac.	<i>Glochidion</i> p.p.	Euph.
<i>Canna</i> *	Cannac.	<i>Gloriosa</i>	Liliac.
<i>Casearia</i>	Flac.	<i>Gonystylus</i> p.p.	Thym.
<i>Celastrus</i>	Celastr.	<i>Guioa</i>	Sapind.
<i>Cephalomappa</i>	Euph.	<i>Harpullia</i> p.p.	Sapind.
<i>Chaetocarpus</i>	Euph.	<i>Hedychium</i>	Zing.
<i>Cheilosa</i>	Euph.	<i>Hevea</i> *	Euph.
<i>Chlorophytum</i>	Liliac.	<i>Homonoia</i>	Euph.

→

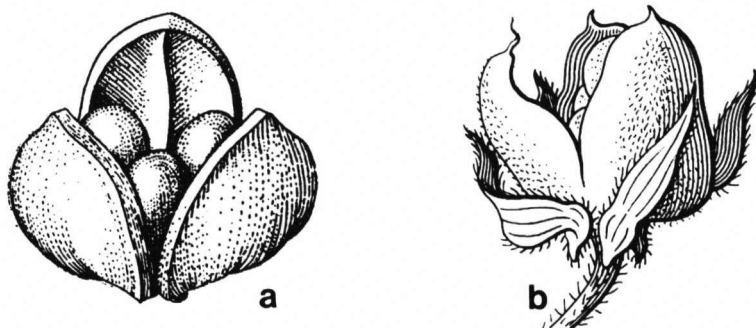
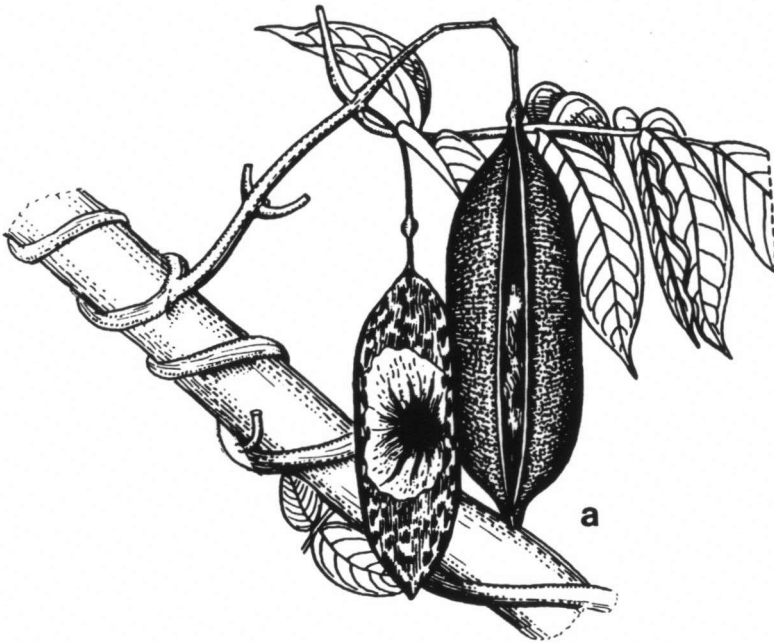


Figure 69. Trilocular capsule — a. *Gonystylus bancanus*; b. *Viola pilosa*.

(101. Three-locular capsule, continued)

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Hybanthus</i>	Viol.	<i>Reissantia</i>	Celastr.
<i>Iphigenia</i>	Liliac.	<i>Richeriella</i>	Euph.
<i>Koilolepas</i>	Euph.	<i>Rinorea</i>	Viol.
<i>Kokoona</i>	Celastr.	<i>Sapium</i> p.p.	Euph.
<i>Lepisanthes</i> p.p.	Sapind.	<i>Sarcococca</i>	Bux.
<i>Leptopus</i>	Euph.	<i>Sauropus</i>	Euph.
<i>Lilium</i>	Liliac.	<i>Sebastiania</i>	Euph.
<i>Lophopetalum</i>	Celastr.	<i>Spathiostemon</i>	Euph.
<i>Macaranga</i> p.p.	Euph.	<i>Sumbaviopsis</i>	Euph.
<i>Mallotus</i>	Euph.	<i>Suregada</i>	Euph.
<i>Margaritaria</i>	Euph.	<i>Synostemon</i>	Euph.
<i>Maytenus</i>	Celastr.	<i>Thysanotus</i>	Liliac.
<i>Melanolepis</i>	Euph.	<i>Tricyrtis</i>	Liliac.
<i>Osmelia</i>	Flac.	<i>Trigonachras</i>	Sapind.
<i>Paranephelium</i> p.p.	Sapind.	<i>Trigonopleura</i>	Euph.
<i>Petrosavia</i>	Liliac.	<i>Trigonostemon</i>	Euph.
<i>Phyllanthus</i> p.p.	Euph.	<i>Viola</i>	Viol.
<i>Pittosporum</i>	Pitt.	<i>Wetria</i>	Euph.
<i>Ptychopyxis</i>	Euph.	<i>Zingiber</i> p.p.	Zing.

Figure 70. Seeds winged – a. *Tecomanthe dendrophila* (Bign.). See also next page.

SEED (characters 102–105)

102. Seeds winged — Fig. 70 (see also Fig. 31, p. 72)

Seeds with a thin flat appendage as in *Casuarinaceae* and *Bignoniaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Acsmithia</i>	Cun.	<i>Schima</i>	Theac.
<i>Aganosma</i>	Apoc.	<i>Schrebera</i>	Oleac.
<i>Agatea</i>	Viol.	<i>Schuurmansia</i>	Ochn.
<i>Agathis</i>	Arauc.	<i>Spiraeanthemum</i>	Cun.
<i>Alloxylon</i>	Prot.	<i>Stenomeris</i>	Diosc.
<i>Altingia</i>	Hamam.	<i>Swietenia</i> *	Meliac.
<i>Amarylloidaceae</i> p.p.	Amaryl.	<i>Tetractomia</i>	Rut.
<i>Aristolochia</i>	Arist.	<i>Toona</i>	Meliac.
<i>Banksia</i> p.p.	Prot.	<i>Triomma</i>	Burs.
<i>Bignoniaceae</i> p.p.	Bign.	<i>Tristaniopsis</i>	Myrt.
<i>Bikkia</i>	Rub.	<i>Tylophora</i>	Asclep.
<i>Caldcluvia</i> p.p.	Cun.	<i>Uncaria</i>	Rub.
<i>Casuarina</i>	Casuar.	<i>Wendlandia</i>	Rub.
<i>Ceuthostoma</i>	Casuar.	<i>Wightia</i>	Scroph.
<i>Cinchona</i> *	Rub.		
<i>Coptosapelta</i>	Rub.		
<i>Cratoxylum</i>	Gutt.		
<i>Crypteronia</i>	Crypter.		
<i>Dactylocladus</i>	Crypter.		
<i>Dioscorea</i>	Diosc.		
<i>Eucryphia</i> (Au)	Euph.		
<i>Flindersia</i>	Rut.		
<i>Gelsemium</i>	Logan.		
<i>Gordonia</i>	Theac.		
<i>Grevillea</i>	Prot.		
<i>Gymnostoma</i>	Casuar.		
<i>Hymenodictyon</i>	Rub.		
<i>Hymenosporum</i>	Pitt.		
<i>Itoa</i>	Flac.		
<i>Ixonanthes</i>	Linac.		
<i>Kokoona</i>	Celastr.		
<i>Lagerstroemia</i>	Lythr.		
<i>Liliaceae</i> p.p.	Liliac.		
<i>Loeseneriella</i>	Celastr.		
<i>Lophopetalum</i>	Celastr.		
<i>Macrozanonia</i>	Cuc.		
<i>Moringa</i> *	Moring.		
<i>Mussaendopsis</i>	Rub.		
<i>Neonauclea</i>	Rub.		
<i>Pinus</i>	Pinac.		
<i>Pterospermum</i>	Sterc.		
<i>Pterygota</i>	Sterc.		
<i>Reissantia</i>	Celastr.		
<i>Rinorea</i> p.p.	Viol.		

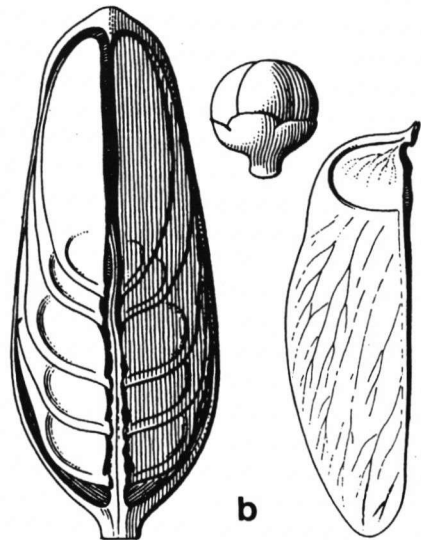


Figure 70. Seeds winged – a. *Tecomanthe dendrophila* (see previous page); b. *Kokoona ovatolanceolata*.

103. Seeds comose— Fig. 71

Seeds provided with a tuft of hairs such as in many *Apocynaceae*, *Asclepiadaceae* and *Compositae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Aeschynanthus</i>	Gesn.	<i>Laggera</i>	Comp.
<i>Aganosma</i>	Apoc.	<i>Launaea</i>	Comp.
<i>Alstonia</i>	Apoc.	<i>Marsdenia</i>	Asclep.
<i>Anaphalis</i>	Comp.	<i>Micrechites</i>	Apoc.
<i>Anodendron</i>	Apoc.	<i>Microglossa</i>	Comp.
<i>Asclepias</i> *	Asclep.	<i>Microstemma</i>	Asclep.
<i>Atherandra</i>	Asclep.	<i>Mikania</i>	Comp.
<i>Blumea</i>	Comp.	<i>Nerium</i> *	Apoc.
<i>Calotropis</i>	Asclep.	<i>Parameria</i>	Apoc.
<i>Ceropegia</i>	Asclep.	<i>Parsonsia</i>	Apoc.
<i>Chonemorpha</i>	Apoc.	<i>Phyllanthera</i>	Asclep.
<i>Cochlospermum</i>	Cochl.	<i>Physostelma</i>	Asclep.
<i>Conyza</i>	Comp.	<i>Pluchea</i>	Comp.
<i>Crassocephalum</i>	Comp.	<i>Pottisia</i>	Apoc.
<i>Cryptolepis</i>	Asclep.	<i>Pterocaulon</i>	Comp.
<i>Cryptostegia</i>	Asclep.	<i>Raphistemma</i>	Asclep.
<i>Cynanchum</i>	Asclep.	<i>Rhynchospermum</i>	Comp.
<i>Dischidia</i>	Asclep.	<i>Salix</i>	Salic.
<i>Dregea</i>	Asclep.	<i>Sarawakodendron</i>	Celast.
<i>Ecdysanthera</i>	Apoc.	<i>Sarcostemma</i>	Asclep.
<i>Emilia</i>	Comp.	<i>Secamone</i>	Asclep.
<i>Epilobium</i>	Onagr.	<i>Senecio</i>	Comp.
<i>Erechtites</i>	Comp.	<i>Sonchus</i>	Comp.
<i>Erigeron</i>	Comp.	<i>Stephanotis</i>	Asclep.
<i>Eupatorium</i>	Comp.	<i>Streptocaulon</i>	Asclep.
<i>Finlaysonia</i>	Asclep.	<i>Strophanthus</i>	Apoc.
<i>Genianthus</i>	Asclep.	<i>Telosma</i>	Asclep.
<i>Gnaphalium</i>	Comp.	<i>Tetramolopium</i>	Comp.
<i>Gymnanthera</i>	Asclep.	<i>Toxocarpus</i>	Asclep.
<i>Gymnema</i>	Asclep.	<i>Trachelospermum</i>	Apoc.
<i>Gynura</i>	Comp.	<i>Tylophora</i>	Asclep.
<i>Heterostemma</i>	Asclep.	<i>Urceola</i>	Apoc.
<i>Hoya</i>	Asclep.	<i>Vallis</i>	Apoc.
<i>Ichnocarpus</i>	Apoc.	<i>Vernonia</i>	Comp.
<i>Inula</i>	Comp.	<i>Weinmannia</i>	Cun.
<i>Ischnostemma</i>	Asclep.	<i>Wrightia</i>	Apoc.
<i>Kibatalia</i>	Apoc.	<i>Youngia</i>	Comp.
<i>Lactuca</i>	Comp.		

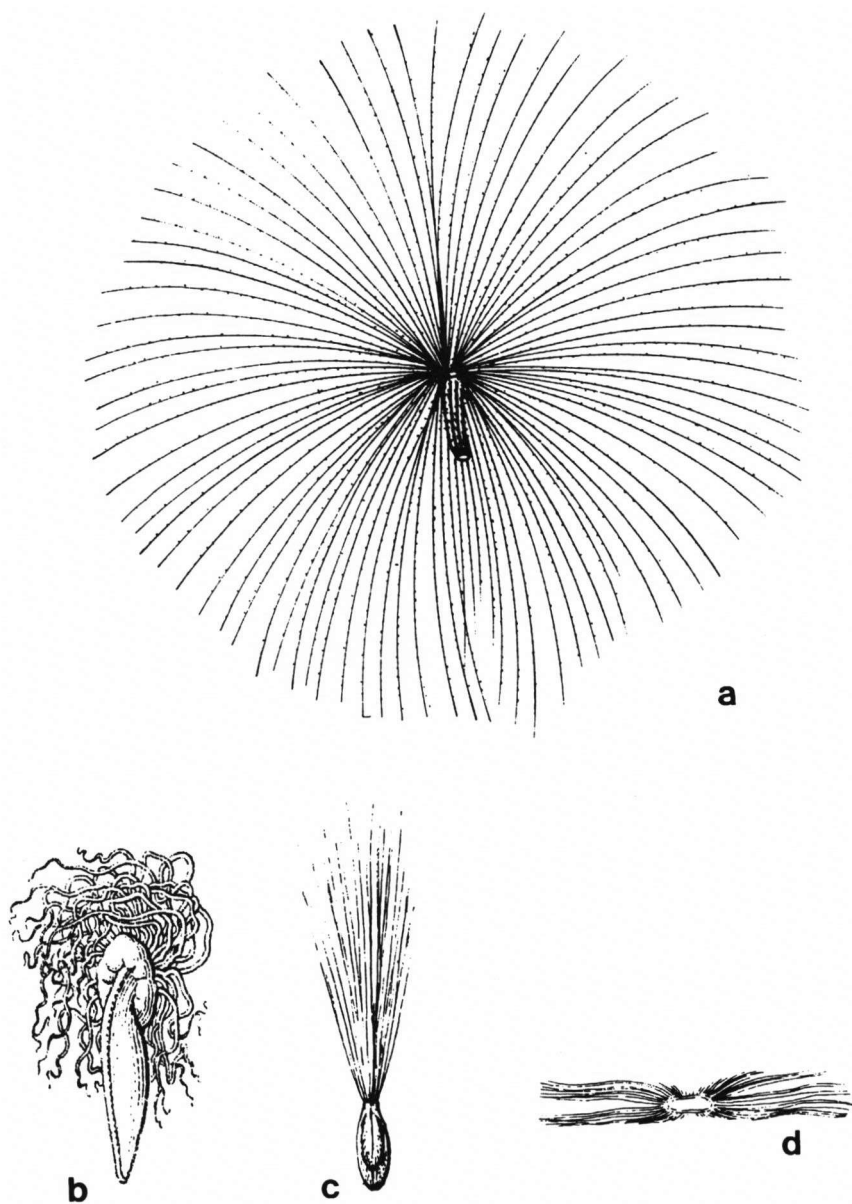


Figure 71. Seeds comose – a. *Crassocephalum crepidioides*; b. *Sarawakodendron filamentosum*; c. *Asclepias curassavica*; d. *Alstonia spathulata*.

104. Seeds arillate — Fig. 72

A usually fleshy and coloured outgrowth of the funicle surrounding the seed, as e.g. in *Meliaceae*, *Myristicaceae* and *Sapindaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Annonaceae</i> p.p.	Annon.	<i>Thymelaeaceae</i> p.p.	Thym.
<i>Apocynaceae</i> p.p.	Apoc.	<i>Violaceae</i>	Viol.
<i>Bombacaceae</i> p.p.	Bomb.	<i>Zingiberaceae</i>	Zing.
<i>Celastraceae</i>	Celastr.		
<i>Commelinaceae</i>	Comm.		
<i>Coniferae</i> p.p.	Conif.		
<i>Connaraceae</i>	Connar.		
<i>Dilleniaceae</i>	Dill.		
<i>Dubouzetia</i>	Elaeoc.		
<i>Euphorbiaceae</i> p.p.	Euph.		
<i>Flacourtiaceae</i> p.p.	Flac.		
<i>Guttiferae</i> p.p.	Gutt.		
<i>Leguminosae</i> p.p.	Leg.		
<i>Linaceae</i> p.p.	Linac.		
<i>Magnoliaceae</i>	Magn.		
<i>Marantaceae</i>	Marant.		
<i>Meliaceae</i> p.p.	Meliac.		
<i>Musaceae</i>	Musac.		
<i>Myristicaceae</i>	Myrist.		
<i>Oxalidaceae</i>	Oxal.		
<i>Papaveraceae</i>	Papav.		
<i>Passifloraceae</i>	Passifl.		
<i>Polygalaceae</i> p.p.	Polygal.		
<i>Sapindaceae</i>	Sapind.		
<i>Sloanea</i>	Elaeoc.		

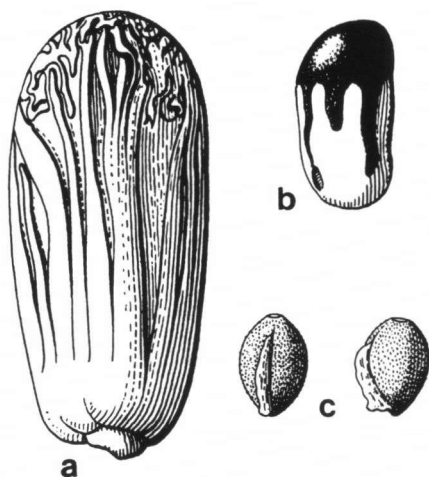


Figure 72. Seeds arillate — a. *Myristica papyracea*; b. *Ellipanthus tomentosus* (Connar.); c. *Viola pilosa*.

105. Ruminant endosperm — Fig. 73

The endosperm of the seeds is folded and on cross section looks like brains. Common in *Annonaceae* and *Myristicaceae*.

<i>Taxon</i>	<i>Family</i>	<i>Taxon</i>	<i>Family</i>
<i>Alyxia</i>	Apoc.	<i>Erycibe</i>	Conv.
<i>Annonaceae</i>	Annon.	<i>Fagaceae</i> p.p.	Fagac.
<i>Araliaceae</i> p.p.	Aral.	<i>Gonocaryum</i> p.p.	Icacin.
<i>Arcangelisia</i>	Menisp.	<i>Kostermanthus</i>	Chrys.
<i>Atuna</i>	Chrys.	<i>Leea</i>	Leeac.
<i>Diospyros</i> p.p.	Eben.	<i>Lepiniopsis</i>	Apoc.
<i>Discocalyx</i> p.p.	Myrsin.	<i>Loheria</i>	Myrsin.
<i>Elaeocarpus</i> p.p.	Elaeoc.	<i>Mangifera</i>	Anacard.

(105. Ruminated endosperm, continued)

Taxon	Family	Taxon	Family
<i>Myristicaceae</i> p.p.	Myrist.	<i>Tiliacora</i>	Menisp.
<i>Palmae</i> p.p.	Palm.	<i>Tinospora</i>	Menisp.
<i>Polyosma</i> p.p.	Sax.	<i>Trichopus</i>	Diosc.
<i>Tabernaemontana</i>	Apoc.	<i>Trimenia</i>	Trim.
<i>Tapeinosperma</i> p.p.	Myrsin.	<i>Viburnum</i> p.p.	Caprif.
<i>Tetramerista</i>	Theac.	<i>Voacanga</i>	Apoc.
<i>Tetrastigma</i>	Vit.		

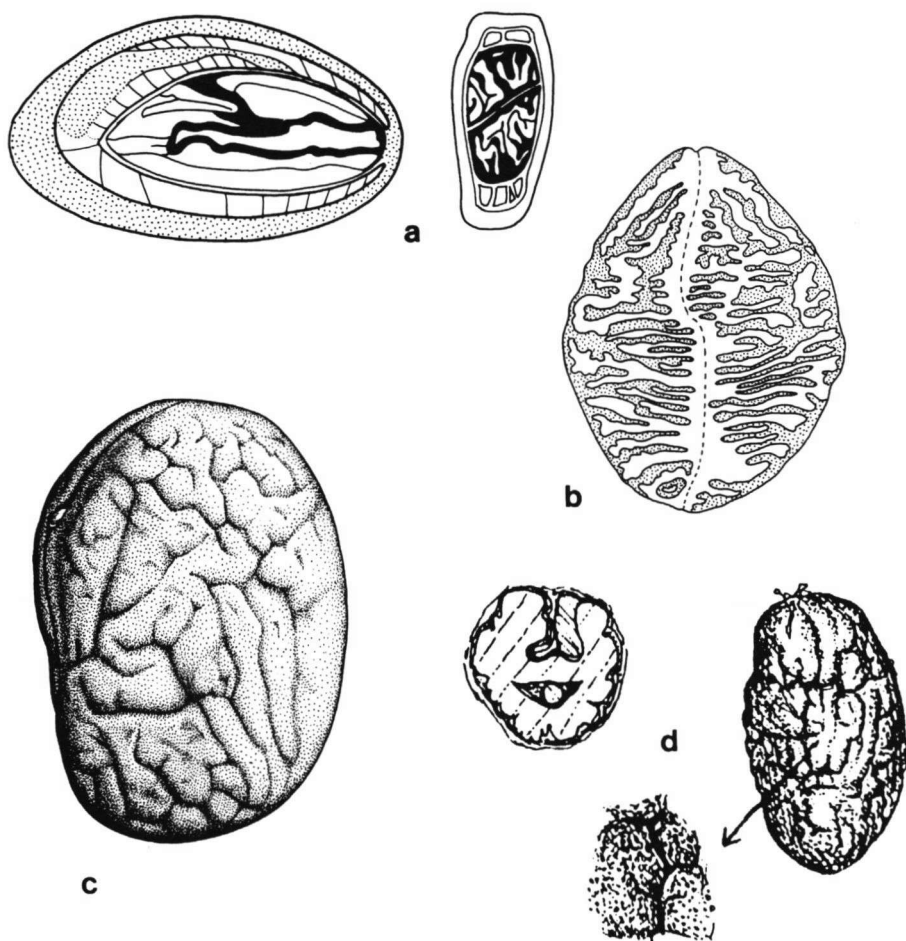


Figure 73. Ruminated endosperm – a. *Erycibe griffithii*; b. *Mangifera inoarpoides*; c. *Mangifera havilandii*; d. *Voacanga grandiflora*.

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